WMS GAMING

SERVICE MANUAL

Upright Video 55X Gaming Device

Including 3-Reel Video Chapter

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CE

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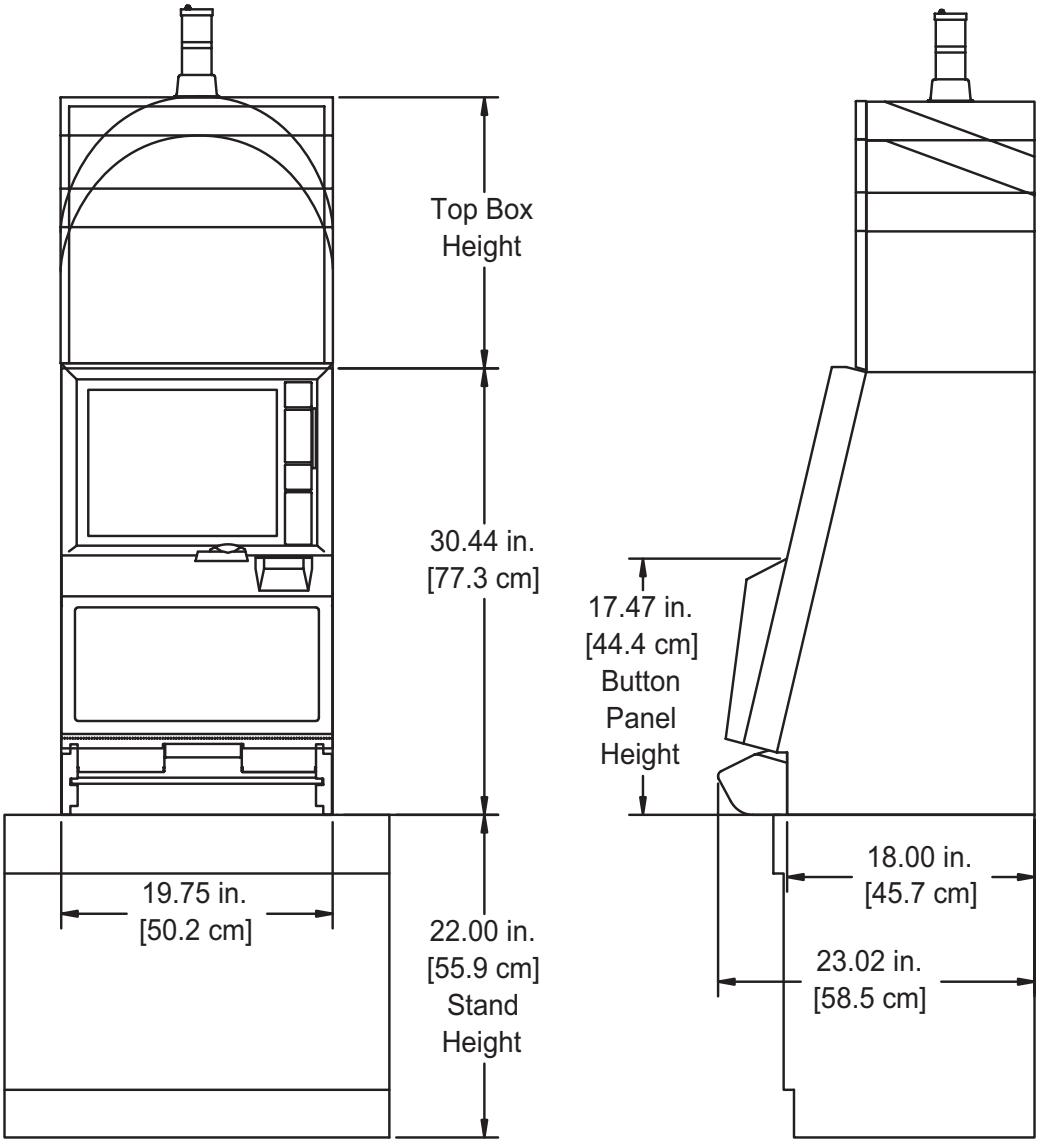
The redesigned Service Manual format is useful to both the technician who is new to WMS games and the experienced professional. The outline format allows the experienced technician to review procedures by reading the headers, while the new technician accesses the detailed information contained in each section. **Technicians of all levels of experience should read all cautions, warnings and notices.**

Layout Data - Base Game Dimensions

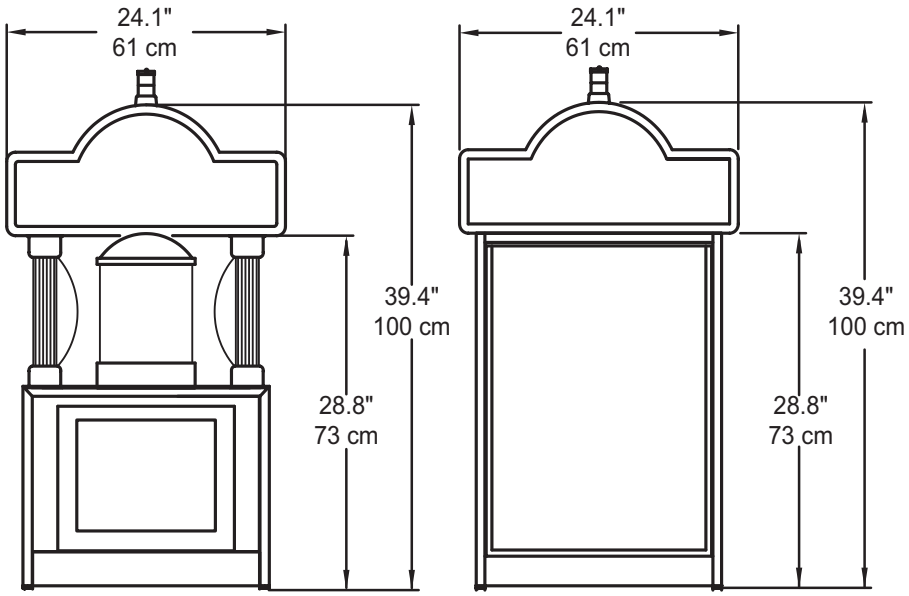
To determine overall height for ceiling clearance requirements, add the following, if used, to the base game height of $30\frac{7}{16}$":

Drop box/game platform, this height varies around 22".
Central system spacer add $2\frac{5}{8}$",
  Spacer is included in Monopoly top box height.
Top box (see next page for specific heights)
Marquee
  Stretch dome add 2"-$2\frac{1}{4}$"
  Flat bottom add $10\frac{5}{8}$"
  Curved bottom add 17"
Tower light standard height is 6", but may vary by a few inches.

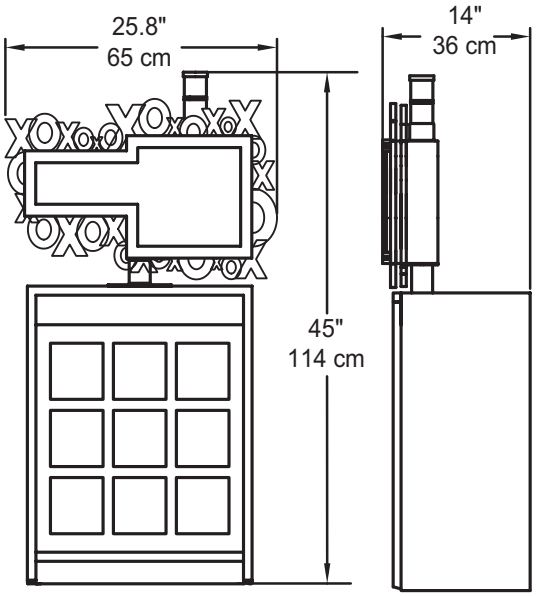
Part Description	Top Box Height
9" Top Box	9.63" or 24.5 cm
16" Top Box	15.88" or 40.3 cm
16" Round Top Box	15.88" or 40.3 cm


Top Box Height
30.44 in. [77.3 cm]
19.75 in. [50.2 cm]
22.00 in. [55.9 cm] Stand Height
17.47 in. [44.4 cm] Button Panel Height
18.00 in. [45.7 cm]
23.02 in. [58.5 cm]

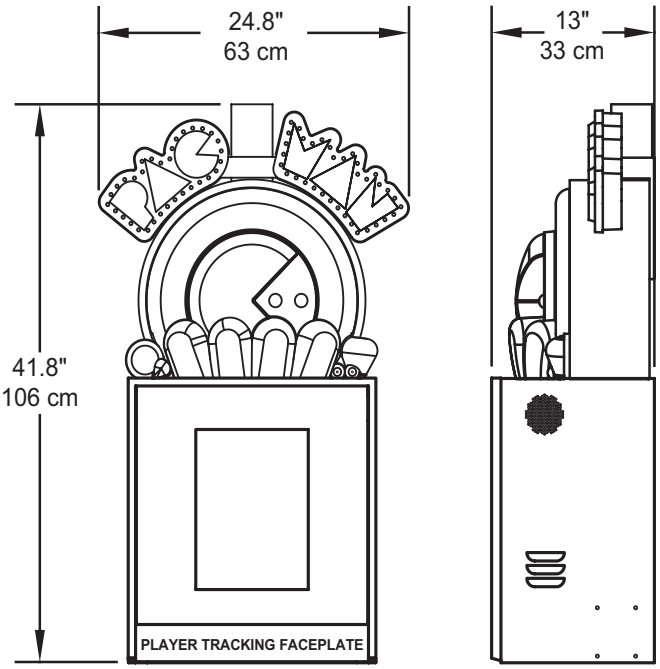
Layout Data - Participation Top Box Dimensions



Money Grab and the standard Monopoly top boxes



Hollywood Squares top box



PAC-MAN top box

Layout Data - Weights

Weight Chart by Part	Weight (lbs)			
	Combustible	Degradable	Inert	Total Weight
Upright Video Base Game	8.28	13.93	197.4	219.61
Top Boxes				
Chairman of the Board 7'	5.75	12.85	67.8	86.4
Movers & Shakers 7'	5.75	12.85	67.8	86.4
Cast for Cash	5.01	3.89	42.34	51.23
Party Train	2.65	5.07	83.85	91.57
Money Grab	7.59	5.26	59.34	72.19
Scrabble	5.01	3.89	42.34	51.23
Hollywood Squares	1.58	5.03	73.55	80.16
PAC-MAN	4.06	10.3	88.59	102.95
Hot Properties	4.82	7.54	72.46	84.82
Marquees				
Curved Bottom	1.88	6	8.3	16.18
Straight Bottom	22.13	6.66	3.46	32.25
Puzzle Pay	0	3.79	3.21	7
Hollywood Squares Upright	10.3	2.03	18.12	30.45

Layout Data - Electrical Requirements

⚠ WARNING

Plugging the game into an improper line voltage source creates fire and electrical shock hazards. An improper line voltage or frequency can also cause game damage or malfunctions.

NOTICE:

Locate the socket outlet close to the installed position of this game.

Power Requirements	
Upright Video Base Game	
Voltage Line Freq Current	120/220-240 VAC 60/50 Hz 4 amps max. at 120 VAC 2 amps max. at 220-240 VAC
*Model TB0 Top Box	
Voltage Line Freq Current	120 VAC 60/50 Hz 3 amps max. at 120 VAC
Total Consumption for a Base Game with a model TB0 Top Box	
	7 amps max. at 120 VAC
*Model TB1 Top Box	
Voltage Line Freq Current	220-240 VAC 60/50 Hz 1.5 amps max. at 220-240 VAC
Total Consumption for a Base Game with a model TB1 Top Box	
	3.5 amps max. at 220-240 VAC

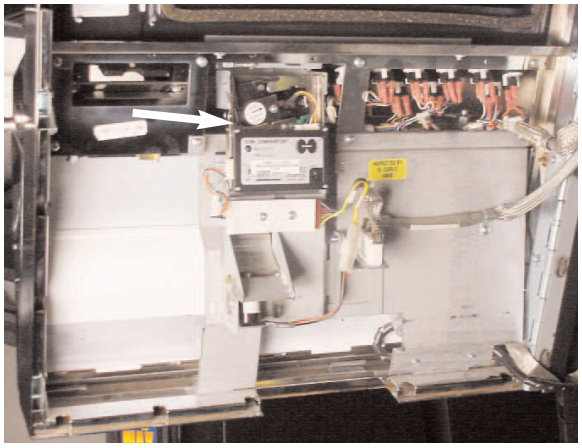
**Model TB0 and TB1 Top Boxes have an extra power supply cord which is plugged in external to the base game. The model designation is found on the serial plate.*

Inspection and Identification

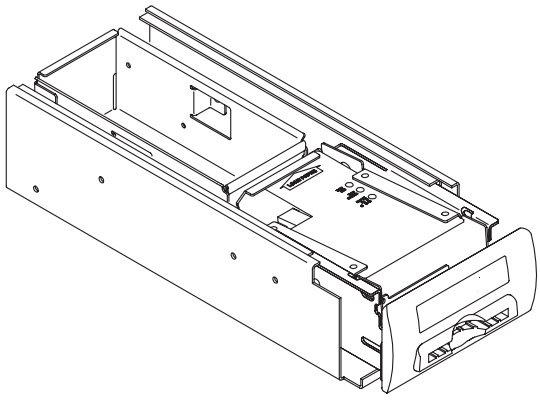
1. Remove and set aside everything from the shipping container. Inspect the cabinet exterior for damage. If damaged, file a claim with your carrier.

2. Unlock and open the main door to access the internal components.

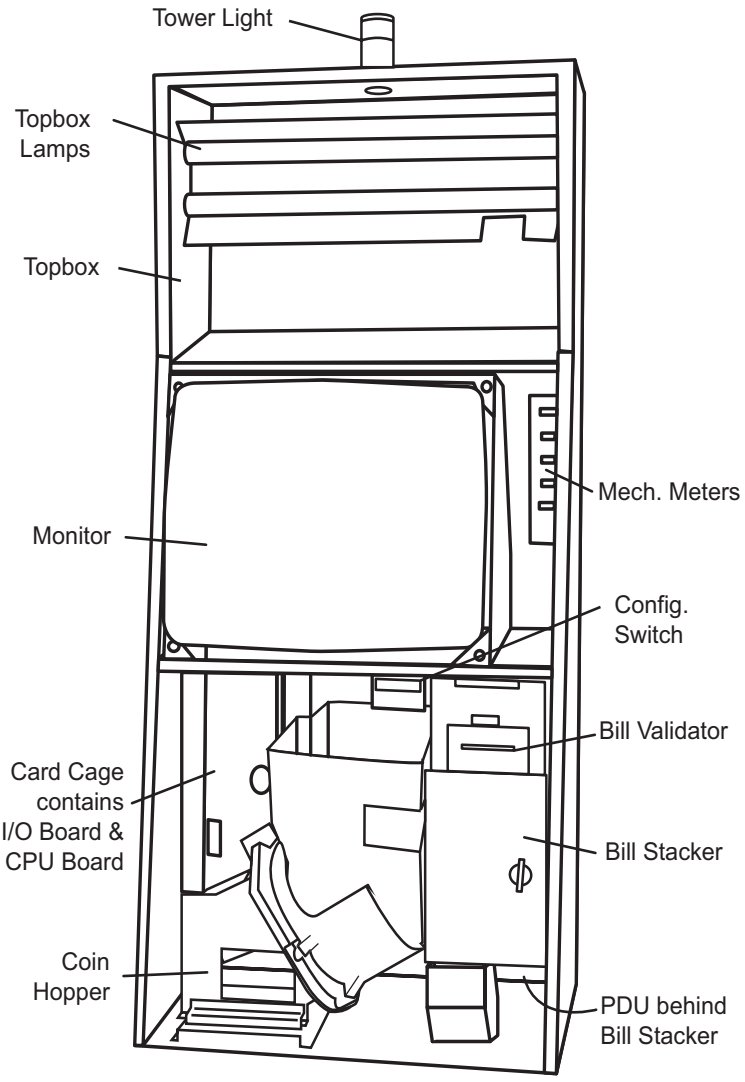
3. Check major components for damage or improper mounting.



Inside of main door, showing the coin mechanism.



The game may have a printer instead of a hopper.



Main components inside the cabinet.

If everything is in good condition, move the game to the desired playing location

Safety - Symbols

The terms *WARNING, CAUTION* and *NOTICE* are used for specific, safety reasons. For emphasis, *WARNING* and *CAUTION* appear beside the characteristic triangle symbol.

- **WARNING** indicates a situation that *may cause personal injury or death.*
- **CAUTION** indicates a situation that *may damage equipment*.
- **NOTICE** indicates a situation that requires special attention.

WARNING

CAUTION

NOTICE:

Legal

Check for the Nameplate. When WMS GAMING INC. ships a gaming device, it complies with International EMC and safety regulations. The gaming device's nameplate is proof of this compliance. If the gaming device's nameplate is missing or damaged, you may become subject to legal action. If the gaming device doesn't include the proper nameplate, call WMS GAMING INC. immediately.

International copyright, trademark and patent laws protects the gaming device. Unauthorized modifications may be illegal under international law. This principle also applies to WMS GAMING INC. logos, designs, publications and assemblies. Facsimiles of WMS GAMING INC. equipment *(or any feature of it*) may be illegal. This principle applies to facsimiles manufactured with or without WMS GAMING INC. components.

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Check Local Laws. Operation of gaming devices may be subject to state and local laws and regulations. This manual doesn't solicit sale of gaming devices where they may not lawfully operate.

The CE Marking appears on gaming devices that meet the requirements of the EU directives. On these products, a Declaration of Conformity states that they satisfy all applicable EMC and safety requirements.

Safety - Monitors

The monitor in the upright game.

Removing the Monitor. Never remove the monitor with game power switched on. Otherwise, damage to the logic and touch screen boards may occur.

Handle CRTs and Fluorescent Tubes with Care. Video machines include monitors with fragile CRTs, and most games contain fluorescent lamp tubes. Fluorescent tubes and CRTs are evacuated glass containers. The vacuum exerts considerable stress on the glass. Because of this stress, if a fluorescent tube or CRT is dropped, it may implode! Shattered glass can fly eight feet or more from the implosion. Take care when handling a monitor. Determine where to place the monitor before removing it.

Servicing Monitors. Only qualified service technicians should turn power on when the monitor is out of the cabinet.

Repairing Monitors. Avoid electrical shocks! When removing or repairing a monitor, take care to avoid electrical shock. High voltages may exist within the monitor circuitry and cathode ray tube (CRT) even after it is disconnected from power. Don't touch internal parts of the monitor with your hands or metal objects! Always discharge the CRT by the following method: Switch off gaming device power at the PDU. Attach one end of a large, well-insulated, 20-kV jumper to ground. Slide the jumper under the anode cap. Momentarily touch the free end of the grounded jumper to the anode. Wait two minutes and discharge the anode again.

Check the Bezel Tape. Regularly check the foam tape on inside surfaces of the monitor hatch. You'll find this tape on the monitor bezel and around the coin entry aperture. If the tape begins to deteriorate, replace it promptly with WMS-approved tape. Bad tape may pose an *electrical shock hazard.*

Safety - PDU and General Power

Properly Ground Gaming Devices. *Avoid electrical shocks.* Don't plug in the gaming device until you inspect and properly ground it. *Only* connect your WMS gaming device to grounded, three-wire outlets. Don't use a cheater plug to defeat the power cord's ground pin. Don't cut off the ground pin. After servicing a gaming device, ensure that ground wires are secure. Only then should you close and lock the gaming device.

If the power supply cord is damaged, it must be replaced by the manufacturer, a service agent, or a similarly qualified person in order to avoid a hazard.

This Gaming Device is not suitable for outdoor use.

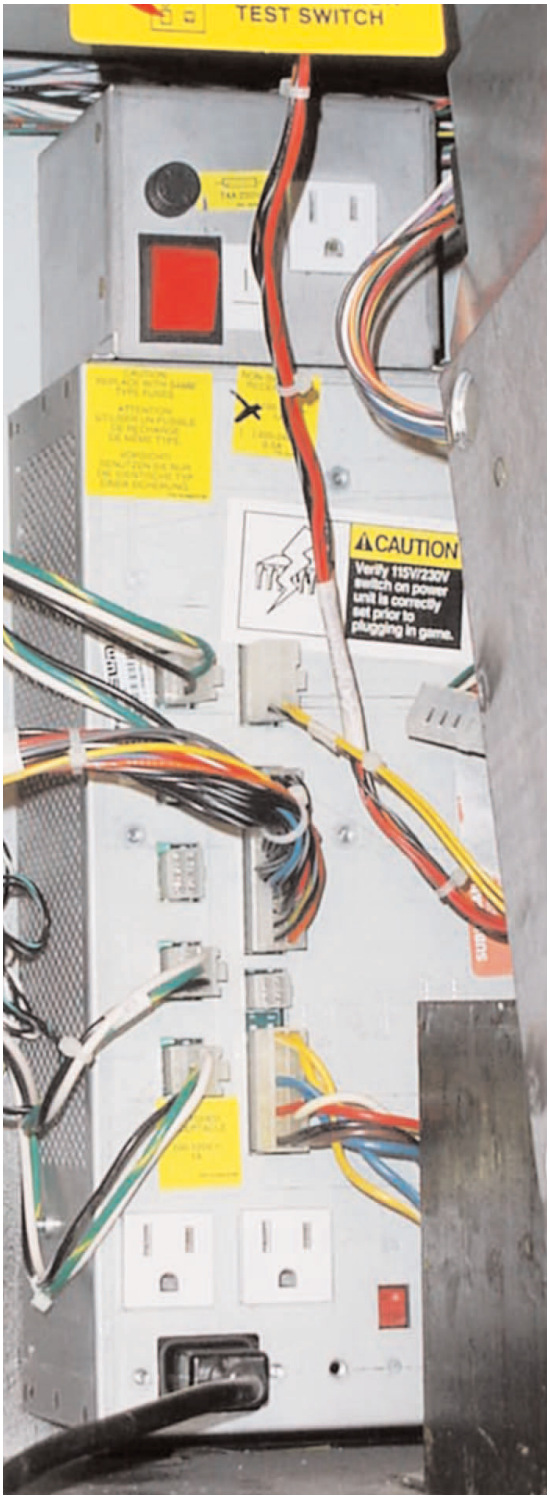
When performing any maintenance or modification to the gaming device, ensure the power supply cord is disconnected from the outlet. Unplugging all power supply cords is the means of disconnecting the game.

Power Distribution Unit. The game's power distribution unit (PDU) supplies power to many game components and accessories. Model TBX Top Boxes, however, are equipped with a separate power supply cord. These Top Boxes may be plugged into a switched outlet.

The PDU has a switch for turning the game on or to standby mode. In standby mode, the switched outlet(s) and many game components are turned off, while the unswitched outlet(s) located on the PDU continues to be powered.

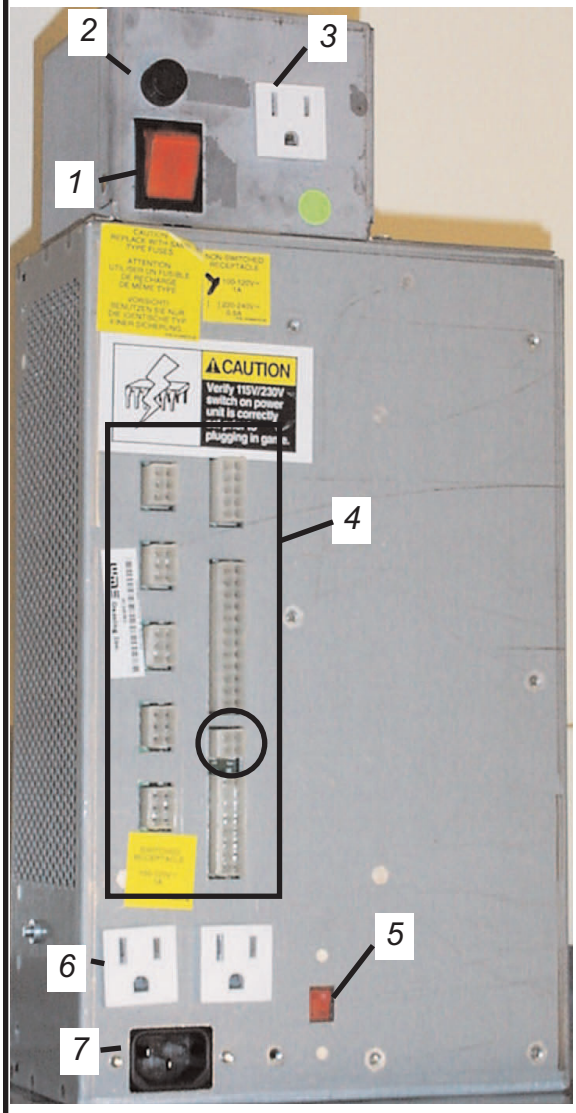
Use the Proper Fuse. To avoid electrical shock, use the replacement fuse indicated on the specification sticker. The replacement must match the original fuse type, voltage rating, and current rating.

Always verify that power is off in the component you are accessing for maintenance or repair.



Power Distribution Unit (PDU)

Safety - PDU and General Power (continued)



Use the Proper Fuse. To avoid electrical shock, use the replacement fuse indicated on the specification sticker. The replacement must match the original fuse type, voltage rating, and current rating.

Check the Line Voltage Sticker. Your gaming device has a built-in service receptacle. This receptacle provides AC line voltage power. For safety, a line voltage sticker must identify the receptacle. A mark on the sticker must specify the intended line voltage (120 or 240 VAC). Operating equipment using the wrong voltage may cause lethal shocks, serious burns and equipment damage. If your gaming device does not include a properly marked sticker, call WMS GAMING INC. immediately.

Adjusting the PDU Voltage Range Switch. The gaming device has a red voltage range switch. It is near the bottom of the PDU. Never change this switch's position with the line cord plugged in. Set the PDU voltage range switch to match the local line voltage range. Setting this switch incorrectly, or changing the switch position under power will cause damage.

The games PDU is located behind the Main Electronics Door beside the Card Cage. NOTE: The PDU has been removed from the game for picture clarity.

The top of the PDU has these features:
1 The power switch: pressing the top will turn the power ON, pressing the bottom will put the game in STANDBY mode.
2 The fuse, the warning label, and the specification label.
3 The unswitched service receptacle with the line voltage label.

The lower portion of the PDU has:
4 Component power supply connectors (the circled connector is not grounded and is unswitched.)
5 The red voltage range switch.
6 Two white switched outlets.
7 Black line cord socket.

Safety - Radio Frequency Interference

FCC Interference Notice. This equipment has been tested and complies with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy. If not installed and used according to the instruction manual, this equipment may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference. The user must correct interference at his own expense.

Canadian Interference Notice. This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

EU Interference Notice. This Class B digital apparatus meets all requirements of the EURO (CISPR 22) EMC specifications and safety requirements.

This gaming device is not intended for use by young children or infirm persons without supervision.

Young children should be supervised to ensure that they do not play with this gaming device.

Tools Required For Setup

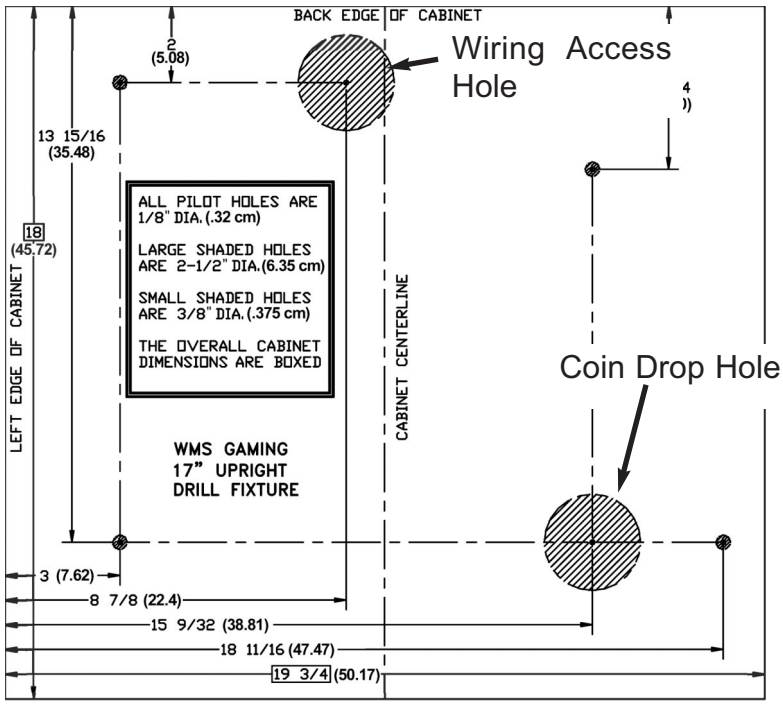
- •Electrical outlet tester
- •#2 Phillips screwdriver
- •7/16" nut driver
- •Chip extractor
- •11/32" nut driver
- •Voltmeter
- •7/8" wrench (for lock installation)
- •Small slotted screwdriver

Mounting the Cabinet

1. Attach the game drop stand to the floor with carriage bolts. Alternately, mount machines back to back on a common stand. Or, mount machines on separate stands, but bolt the bases together from back to back. Otherwise the stand can tip over, causing injury or damage.

2. If necessary, use the drilling template (P/N 16-003296) to drill four anchor clearance holes and two access holes into the top of the stand.

3. Pull the Hopper out of the game to gain access to the bolt holes.


BACK EDGE OF CABINET
Wiring Access Hole
2 (5.08)
13 15/16 (35.48)
18 (45.72)
LEFT EDGE OF CABINET
ALL PILOT HOLES ARE 1/8" DIA. (.32 cm)
LARGE SHADED HOLES ARE 2-1/2" DIA. (6.35 cm)
SMALL SHADED HOLES ARE 3/8" DIA. (.375 cm)
THE OVERALL CABINET DIMENSIONS ARE BOXED
WMS GAMING 17" UPRIGHT DRILL FIXTURE
CABINET CENTERLINE
Coin Drop Hole
3 (7.62)
8 7/8 (22.4)
15 9/32 (38.81)
18 11/16 (47.47)
19 3/4 (50.17)

Anchor and Access Hole Template.

4a. If the stand is made of metal, drop four 5/16" x 1-1/4" hex head bolts down through the clearance holes and secure the cabinet to the drop stand with the jam nuts.

4b. If the stand is made of wood, drop four 3/8" x 2" carriage bolts down through the clearance holes and secure the cabinet to the drop stand with the hex nuts.

Hopper (if configured with a hopper)

1. Access the Hopper.

2. The Hopper has a rotary-type line frequency switch located on a vertically mounted Hopper Control Board near the motor beneath and beside the hopper bowl. Check this switch's setting to see that the factory setting matches the local line frequency. If not, set the switch to match the local power line frequency. Notice the arrow on the switch face. This arrow points to either "110" or "220." (The switch labels are not indicating line voltage.)

   • In 60 Hz areas, the arrow should point to "110."
   • In 50 Hz areas, the arrow should point to "220."

   To adjust the switch, insert a small screwdriver into the slot on top of the switch. Turn the screwdriver to select the hopper line frequency.

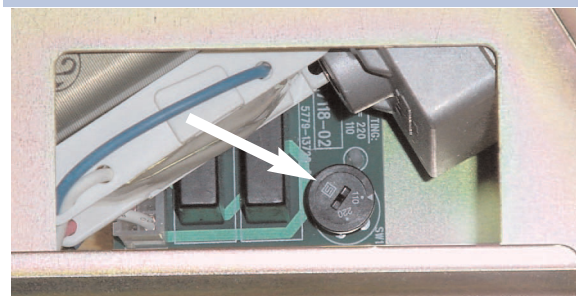
6. Loose hardware may have fallen into the Hopper; clear it out to prevent Hopper jams. Also, before filling the Hopper with coins, remove any dust, dirt, and other foreign matter.

7. See the table titled Hopper Probe Level (right). Adjust the hopper coin-level probe. Move the probe to a higher hole if you would like the Hopper to hold more coins. Move the probe to a lower hole to lower the number of coins the Hopper can hold.

8. Slide the Hopper into the cabinet.

CAUTION

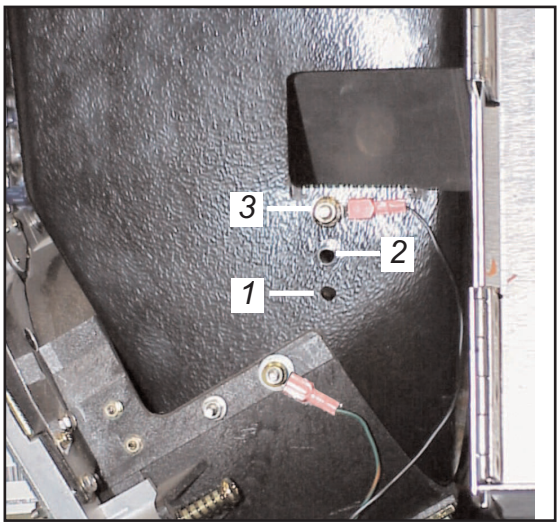
Switch the PDU to Standby mode. This will power down the hopper before unplugging or plugging it in. Otherwise, you will damage the hopper.



The Line Frequency Switch

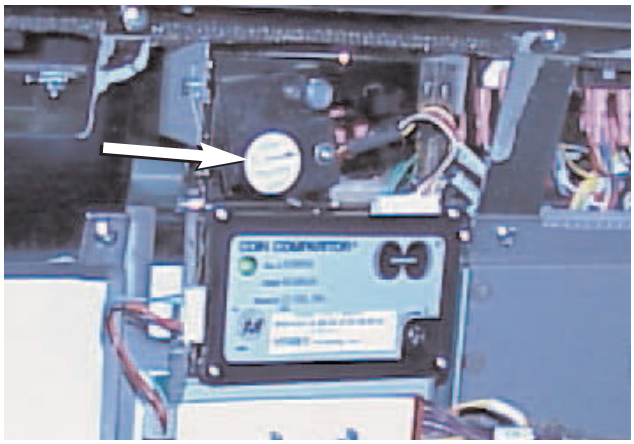
Approx. Max. Coin Capacity			
Level	**U.S. $1**	**25¢**	**5¢**
Full Bowl	1000	4400	4800
3rd Probe	550	2100	2600
2nd Probe	450	1650	2160
1st Probe	350	1250	1650

Hopper Probe Level



Hopper Probe Locations -
Shown with probe set in 3rd hole.

Coin Comparators/Validators



1. If the game has a Coin Mechanisms Micro Comparator 40 (MC-40) or the Coin Comparator 16 (CC-16), install a sample coin of the proper denomination into the Comparator. IDX Coin Xeptors and the Condor validators will already be calibrated in the factory to use the Hopper's denomination. NRI coin validators are preprogrammed. To program, see the Periodic Service Chapter.

Insert a sample coin where indicated.

Printers (if configured with a printer)

⚠ CAUTION

Never use the printer beak to lift the Dot Matrix printer.

1. Remove packing or tape that may secure the printer.
2. Verify that the printer power supply is plugged into the switched outlet on the PDU.
3. Verify that the harnesses are securely connected to the printer and the backplane.

Host Communication

⚠ WARNING

Avoid electrical shocks! The optional player tracking device (PTD) must be a US/C approved type which plugs into a wall receptacle or the service receptacle of the PDU (power distribution unit). Alternately, an unapproved PTD may operate from a US/C approved AC adapter.

• To protect cables, grommet PTD mounting holes in the game.

• PTD mounting holes in the game must not allow access to live parts.

1. Install host communication cables according to recommendations of the communications system provider. Connect the communication cables to the backplane at the Host Port Socket.

Note: If the game also has a printer, refer to applicable printer bulletin for connections.

• PTD power consumption must not exceed the rating of the receptacle.

• A line voltage-powered PTD must have a separate enclosure.

• Ground the system, if the 4-pin socket on the PDU is used for power.

Power

1. Verify that the line voltage at the outlet is either 100 to 120 or 220 to 240 VAC.

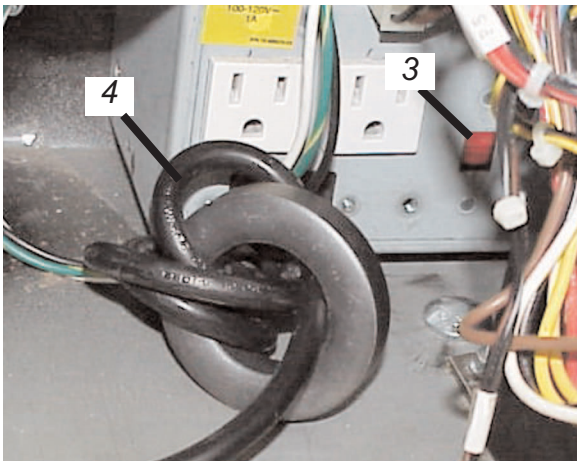
2. Use an outlet tester to check for properly implemented ground, hot and neutral outlet wiring. Only use a grounded AC outlet. The gaming device accepts a line frequency of 50 to 60 Hz. Plugging your game into an improper line voltage source may create a fire and electrical shock hazard. An improper line voltage or frequency can also cause game damage or malfunctions. If the outlet checks okay, proceed to Step 3.

3. The power distribution unit is at the rear of the game. A switch on the connector side of the PDU selects the line voltage. One side of the switch reads 115 for a range of 100 to 120 volts, and the other side reads 230 for a range of 220 to 240 volts. Select the same number as the supplied voltage.

4. Loop the main AC power cord three times through the hole in the 2.4" toroid (P/N 5556-005782-00) at the PDU plug end.

5. Switch the game to standby at the PDU. Feed the AC power cord through the rear floor access hole (See the Hole Template on page 12) and through the stand. Plug the female end of the line cord into the power distribution unit. Then plug the male end of the line cord into the tested socket.

6. Plug the male end of the Top Box line cord into a tested socket external to the game, not into the PDU.



Bottom of the PDU.

⚠ WARNING

Plugging your game into an improper line voltage source creates fire and electrical shock hazards. An improper line voltage or frequency can also cause game damage or malfunctions.

⚠ CAUTION

Some Top Boxes use an additional power supply cord. Disconnect all power supply cords before servicing to avoid electrical shock.

⚠ CAUTION

The Socket Outlet is the means of disconnection, and shall be installed near the equipment and shall be easily accessible

Lock Specifications

Replace the shipping locks with locks according to the following specifications.

(Specifications for standard locks in inches)

Cam Mounting Hole has a diameter of 0.280” and is 0.220" between the flat sides.

	Barrel Length	Double D Barrel Size	Rotation to Unlock
Belly Door	5/8"	0.75 x 0.635"	CW
Card Cage Door	5/8"	0.75 x 0.635"	CW or CCW
Cassette, WBA Lk#1	5/8" or 1-1/8”	0.75 x 0.635"	L Hole-CW
Cassette, WBA Lk#2	5/8" or 1-1/8”	0.75 x 0.635"	R Hole-CW
Main Door	5/8"	0.75 x 0.635"	CCW
Stacker Door, BV Lk#1	5/8"	0.75 x 0.635"	CW or CCW
Stacker Door, BV Lk#2,	5/8"	0.75 x 0.635"	Opposite of Lock 1
Switch, Jackpot Key	< 2.5"	0.75 x 0.680"	N/A

(Specifications for standard locks in mm)

Cam Mounting Hole has a diameter of 7 and is 6 mmbetween the flat sides.

	Barrel Length	Double D Barrel Size	Rotation to Unlock
Belly Door	16 mm	19 x 16 mm	CW
Card Cage Door	16 mm	19 x 16 mm	CW or CCW
Cassette, WBA Lk#1	16 or 28.6 mm	19 x 16 mm	L Hole-CW
Cassette, WBA Lk#2	16 or 28.6 mm	19 x 16 mm	R Hole-CW
Main Door	16 mm	19 x 16 mm	CCW
Stacker Dr, BV Lk#1,	16 mm	19 x 16 mm	CW or CCW
Stacker Dr, BV Lk#2,	16 mm	19 x 16 mm	Opposite of Lock 1
Switch, Jackpot Key	< 64 mm	19 x 17 mm	N/A

Install Software

Install the software according to the *Software Installation and Changes Chapter* in this manual.

Prepare for Play

1. Adjust the preferences and volume in the Administration Mode. See the *Software Installation and Changes Chapter* in this manual.

2. Fill the hopper with coins of the proper denomination. See the Hopper Probe Level table on *page 1-13*. This table provides the optimum number of coins for each coin-level probe hole.

3. Load thermal printers with tickets (instructions are on the printer) and dot matrix printers with a paper roll (See the *Periodic Service Chapter*, page 5-12).

4. Open the top box glass and the LCD to test for correct switch splicing. After testing, close the LCD and replace the glass.

5. Record the meter totals.

6. Close and lock the game.

New Theme Updates

This area of the Setup Chapter is reserved for new Theme statistics, dimensions, and special procedures related to the themes' installation.

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Overview

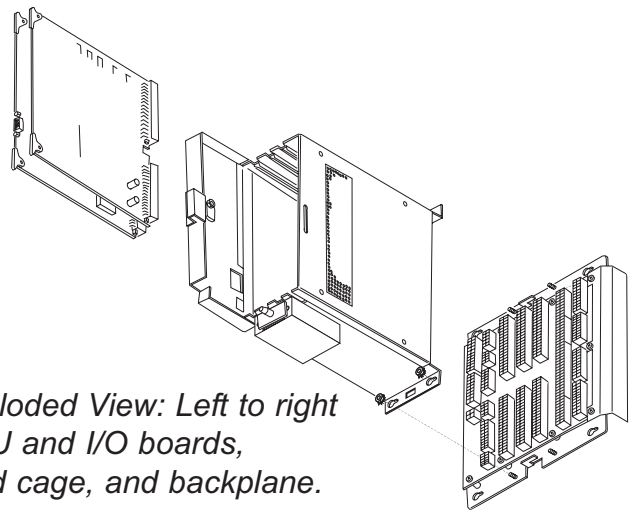
Software will need to be installed whenever a new game is delivered because many jurisdictions do not allow games to be shipped with the software installed (also whenever a theme is changed or a new software version is released).

In this manual, switch or button names appear in CAPITAL letters. For example, “press DIAGNOSTIC.” DIAGNOSTIC refers to the button behind the Main Door.

Identification

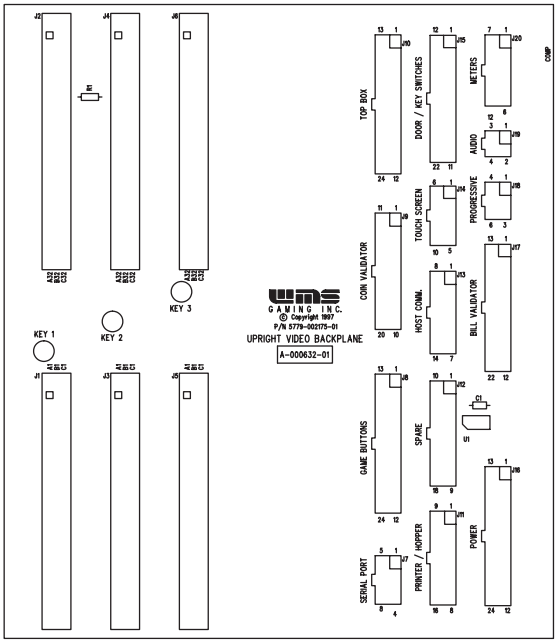
Card Cage Components

The CPU Board and I/O Board reside in the card cage. The card cage is behind the Main Door. At the back of the card cage is a blind mating backplane. This backplane attaches peripherals to the card cage circuit boards. For security purposes, the card cage door locks. A door security switch also monitors door openings and closures.



Exploded View: Left to right CPU and I/O boards, card cage, and backplane.

Identification



The backplane board.

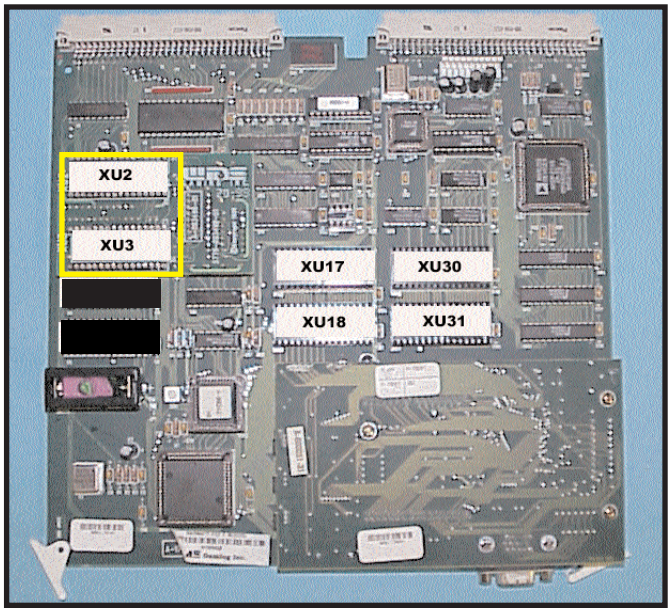
Backplane and CPU EEPROMs

A security EEPROM resides on the CPU Board. (Some machines have two CPU EEPROMs.) Another EEPROM resides on the Backplane. These chips contain EPROM identifier data that the GD uses to reinforce its security.

Backplane and CPU EEPROM Security

A CPU Board EEPROM contains error detection data. The CPU monitors this data during access to the EEPROM. Corrupt data or a bad EEPROM causes a tilt to appear on the monitor...

- **"TILT: SECURE MEMORY CRC CORRUPT"** indicates a CPU Board EEPROM XU27 data error.



CPU 1.5 board with video daughter card and the yellow square indicates the location for the EPROM extender daughter board.

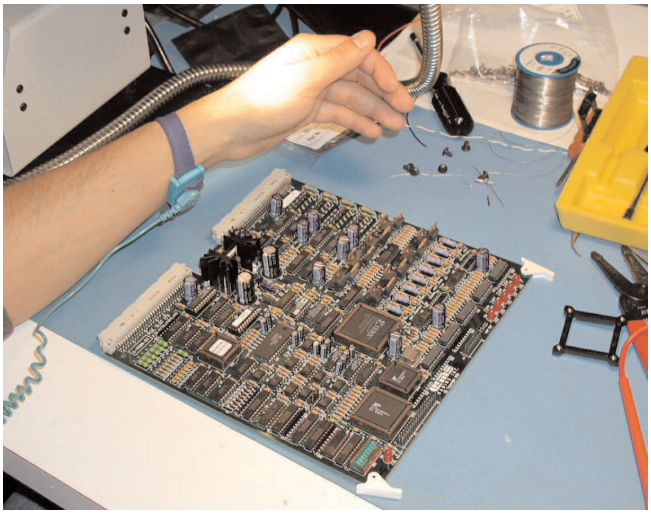
Note: When RAM clearing a game using the CPU 1.5 an EPROM extender daughter board (P/N A-003498-01) must be used. This daughter board plugs into the highlighted XU2/XU3 area and must remain in place attached to the CPU during the RAM Clear procedure. (In the past, when using 1M RAM Clear Chips, the extender board did not have to be in place when performing a RAM clear.)

Best Practices

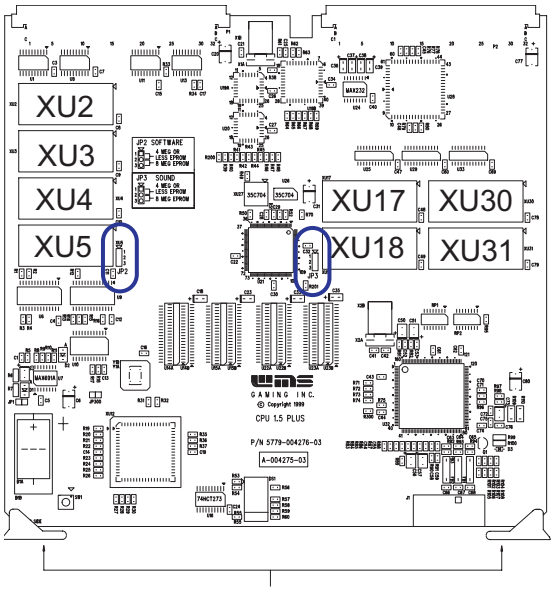
Before removing the boards, always ground yourself by touching bare metal on the cabinet to protect the PC Boards from static discharges. Try to handle the boards by their edges, avoiding contact with the traces. When swapping EPROMs, place the board on a conductive ESD mat, use a grounding strap and chip extracting tools. Avoid bending EPROM leads.

CAUTION

Failure to observe static protection procedures can damage computer components and void your warranty.



A technician using the wrist strap and mat.

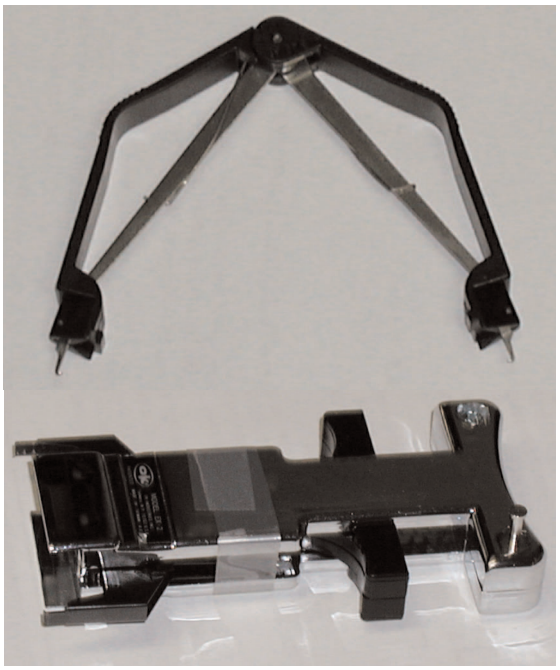


CPU 1.5+ Board

Verify that the RAM Jumper setting (circled above) on the board matches the memory size of the EPROMS (4 or 8 meg).

Disengage the CPU Board by pulling the white board ejector tabs toward you.

Engage the board by pushing its white board ejector tabs toward the cage.

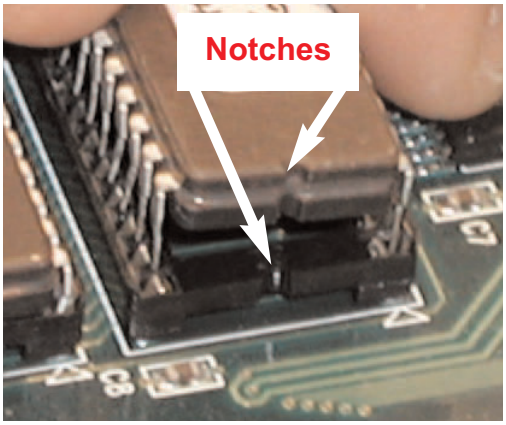


Two of the available chip extractor tools.

RAM Clear / Software Installation Procedure

CAUTION

This procedure erases stored information. Don't clear the RAM and install software unless host system personnel have authorized the process.



Proper EPROM Alignment

CAUTION

Proper alignment of the EPROM chip is crucial. When inserting EPROMs, match EPROM notches to the notches on chip sockets. White markings on the board also indicate proper chip notch position. Improperly inserting a chip can destroy it.

1. Obtain the most recent WMS RAM clear chip.
2. Unlock and open the main door.
3. Power down the game at the PDU.
4. Disconnect the video cable from the front of the card cage.
5. Unlock and remove the card cage door.
6. Remove the CPU board.
7. Install EPROMs at these CPU board locations:
   - Game EPROM at XU2, XU4, XU5
   - RAM clear chip at XU3
   - Sound EPROMs at XU17, XU18, XU30 and XU31

   (Some games don't use all of these EPROMs.)
8. Return the CPU Board to the card cage. Make certain that the board is securely seated.
9. Reconnect the video cable.
10. Turn the game power ON at the PDU.

If the setup is proceeding correctly, these events should occur:

- The machine bongs once, indicating a normal initialization
- The monitor and lamps power up
- The bill validator whines as it undergoes a self test

If the lamps don't light and you don't hear the bong: Verify that the game is plugged into an active, unswitched AC outlet? Troubleshoot the game, if it sounds more than one "Bong."

The monitor shows a menu allowing selection of coin validator, country, denomination, and type.

RAM Clear / Software Installation Procedure

11. Select the Country Code if applicable.

12. Select the denomination that is appropriate for the game.

13. Select “coin” or “token” depending on the denomination selected.

14. After denom and coin type are selected, press the “ACCEPT” button on the screen.

15. A new button will appear on the screen that reads “CONFIRM.” Press “CONFIRM” now to clear the RAM and overwrite the EPROM data; the game will "bong" 3-4 seconds later as it accepts this command. You must wait for the audible “bong” before powering down the PDU in the next step. Monitor will then display “RAM CLEARED. TURN OFF POWER AND REPLACE EPROM.”

16. Turn the game power to STANDBY at the PDU.

17. Remove the CPU board.

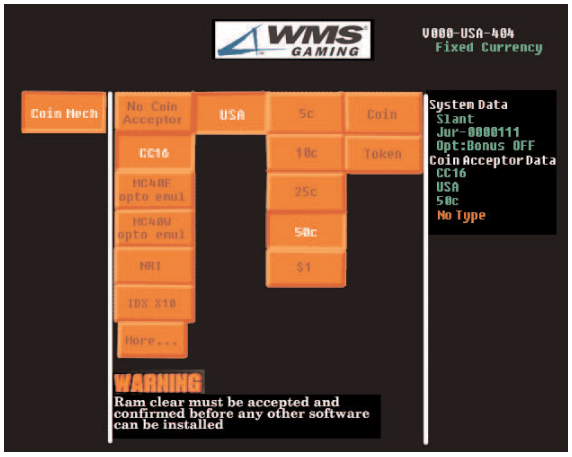
18. Replace the RAM Clear Chip with the Game EPROM in socket XU3. Track the software installation in the official logbook.

19. Replace CPU board and card cage door assembly and lock the door.

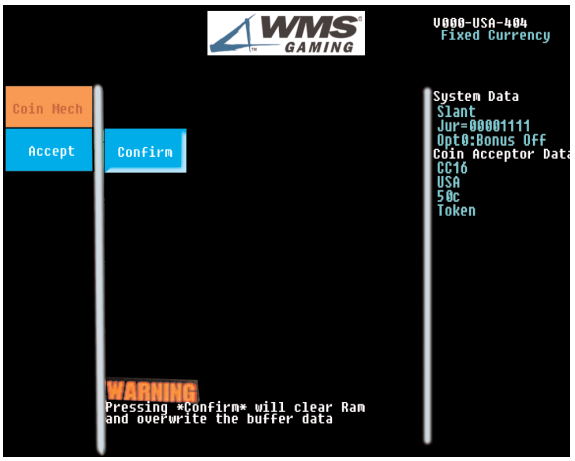
20. Reconnect the video cable to the CPU Board’s Video Port, and secure with the thumbscrews.

21. Turn game power ON. The tilt “MEMORY CLEARED” should appear on the monitor. This message indicates proper clearing of the RAM.

22. Press the white Diagnostic Button to bring the game into PLAY mode.



Coin Mech. Configuration Menu

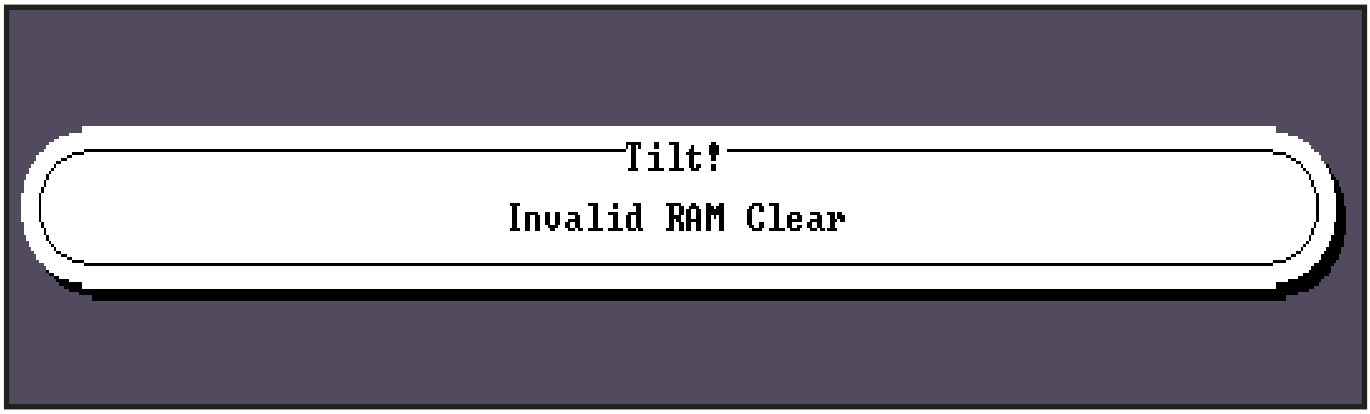


Accept and Confirm Choices

Incomplete and Invalid RAM Clear Checks

Extra security enhancements were implemented in OS 2.57 A1 in order to prevent RAM from booting up on non-zeroed data right after a hard RAM clear. An “Incomplete RAM Clear” could be generated at boot-up after a hard RAM clear if the process was not performed correctly. Also, a version control system will be implemented to prevent older, obsolete RAM clears from being used.

In OS 2.57 A1, an “Incomplete RAM Clear” tilt will occur if the RAM clear did not complete properly.



In OS 2.57 A1, an “Invalid RAM Clear” tilt will occur if the RAM clear that was used wasn't a valid RAM clear version.

Chapter 2. Diagnostic Software

The GD should contain one or two EPROMs for initial inspection. WMS issues game EPROMs separately. During inspection, the GD runs *diagnostic software.* This software helps you to verify that the GD functions properly. Use this chapter as a guide to diagnostic software. After the GD passes diagnostics, replace the diagnostic EPROMs with game EPROMs.

NOTICE

This manual covers Version 2.39 diagnostic EPROMs XU3 and XU27.

After you switch on the power, Administration Mode appears on the GD screen. Administration Mode contains four windows...

- ***Services*** Enables you to confirm the software level or set the date and time
- ***Tests*** Enables you to check GD functions
- ***I/O*** Enables you to examine performance of I/O peripherals
- ***History*** Enables you to review events that raised error flags

Services

The Services Window has three buttons...

• REVISION • SET DATE • SET TIME

Services

♦

Revision

Set Date

Set Time

Revision

To display the diagnostic software version, release date and time, touch REVISION.

Set Date

Use the arrows to position the cursor in the date display. Use the onscreen keypad to enter the correct date (MMDDYY). Then touch the OK button. The window closes.

Set Time

Use the arrows to position the cursor in the time of day display. Use the onscreen keyboard to enter the time in 24-hour form. Then touch the OK button. The window closes.

Tests

Tests

♦

Automatic Test

Printer Test

Video

Touch Screen

Hopper Tests

Sound

Secure Memory

Comm Status

Automatic Test

Automatic Test Mode allows you to *continuously* test GD hardware. Touching AUTOMATIC TEST opens a window on the screen. Inside the window are these buttons...

• OUTPUT TESTS • SOUND TESTS • VIDEO TESTS

NOTICE

Turning the ADMINISTRATOR KEY won't allow you to exit Automatic Tests Mode.

Touch the desired tests. Then touch GO! to start the tests. The GD repeats these tests until you touch EXIT. If the tests identify problems, the screen displays error messages.

Output Tests

Touch OUTPUT TESTS. A window lists tests by device name. Devices include the printer, lamps and solenoids. As Automatic Tests Mode proceeds, the button for the test device turns on. After the test, the button turns OFF. Each test lasts one second.

Sound Tests

Touch SOUND TESTS. A window displays four sound buttons...

• LOW TONE • WARNING TONE • HIGH TONE • NOISE TONE

Buttons turn on sequentially for a second, as the speaker emits corresponding tones. (Set volume at the Sound Window described later in this chapter.) An additional button entitled SOUND CALL, is reserved for future development.

Video Tests

Touch VIDEO TESTS. The monitor displays the color palette, crosshatch pattern and purity screens *(red, green, blue, white).*

CAUTION

Always print several receipts before closing the main door. Be sure that the printer doesn't jam!

Printer *(for GDs with the printer option)*

Touch PRINTER. A new button, PRINT 1 TICKET, appears...

Print 1 Ticket

Touch PRINT 1 TICKET to print a test ticket. This ticket should contain the alphabet in large and small capitals, and other symbols. These symbols include the WMS Gaming logo. If the printer doesn't work, be sure that you configured your printer correctly. Then check or swap the cable between the printer and CPU Board.

NOTICE

Monitor adjustment knobs are on the top edge of the monitor. The exact adjustment knob location depends on the type of monitor provided with the VGD.

Video

The three VIDEO options assist you with monitor adjustments. *(For more on these adjustments, consult your monitor manual.)*

Palette *(Color Bars)*

The PALETTE color bars screen simplifies color gun adjustments.

Convergence *(Crosshatch Pattern)*

The CONVERGENCE option displays a crosshatch pattern. Use this pattern during convergence and raster positioning. The crosshatch pattern will also help during raster height and width adjustments.

Red, Green, Blue, White *(Purity Screens)*

The buttons marked RED, GREEN, BLUE and WHITE open solid color screens. These screens help during purity adjustments,

relative gun output tests, degaussing and rejuvenation. Use the white screen for color temperature testing.

Touch Screen

Touch TOUCH SCREEN to adjust or verify screen calibration. TOUCH SCREEN opens a window with two buttons: TOUCH CAL and TOUCH TEST.

Is calibration so poor that you can't activate the Touch Screen Test from the screen? Press the CHANGE button and simultaneously turn the ADMINISTRATOR KEY switch. The GD automatically enters the Touch Cal Option Mode.

Touch Cal

Touch TOUCH CAL to open its window. TOUCH CAL matches cursor position to touch position. Touch the number 1 in the window's bottom left corner. A new window replaces the first. Touch the number 2 in the window's top right corner. The screen calibrates to your touch. Then the Tests Window returns.

Touch Test

Touch TOUCH TEST to open its window. TOUCH TEST reveals how well the cursor tracks finger movement. Touch several screen loctions. Notice the "Down" and "Lift" coordinates in the window's bottom left corner. These report where your finger touched and rose off the screen. The "Drag" coordinates define where your finger currently rests on the screen.

Hopper Tests *(for GDs with the hopper option)*

Touch HOPPER TESTS to open the Hopper Test Window. Put at least 30 coins in the hopper for this test. During the test, the monitor counts coins paid out. *The Hopper Test checks the...*

- HOPPER DRIVE CIRCUITRY
- HOPPER MOTOR
- MOTOR BRAKE
- COIN-OUT PROXIMITY SENSOR

The I/O Board enables the hopper driver, a solid state relay *(SSR).* The SSR switches on the hopper motor and releases the brake.

Touch ONE COIN or 10 COINS to *test the hopper's ability to dispense coins.* The hopper responds by dispensing a coin or coins. A coin-out sensor detects each coin leaving the hopper. The sensor transmits this information back to the CPU Board.

Touch SHUT OFF HOPPER to *disable the hopper motor and engage the brake.* The CPU responds by deactivating the SSR. The SSR switches off the hopper motor and applies the brake.

Touch EXIT to *leave the Hopper Test Window.*

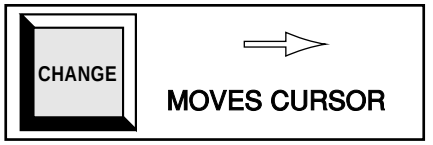
Dead Touch Screen?

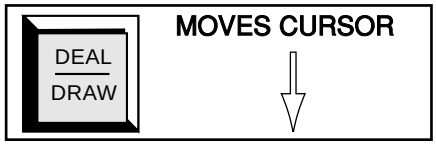
To move the cursor-10-button game:

- DEAL/DRAW (or PLAY) button moves the cursor down. When the cursor reaches the screen's bottom edge, the cursor wraps around.
- CHANGE (or BET ONE) button moves the cursor horizontally, toward your right. When the cursor reaches the right screen edge, the cursor wraps around.

To move the cursor-12-button game:

- 3-LINES button moves the cursor down. When the cursor reaches the screen's bottom edge, the cursor wraps around.





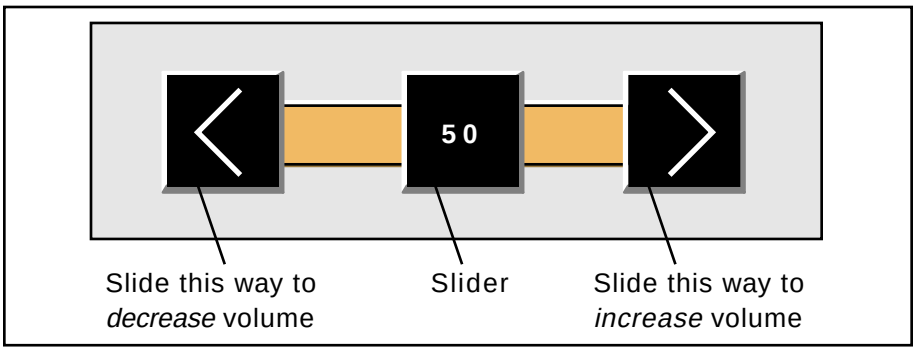
- CHANGE or 5-LINES button moves the cursor horizontally, toward your right. When the cursor reaches the right screen edge, the cursor wraps around.

To make a selection (both games):

- Turn the ADMINISTRATOR KEY to enter Administration Mode.
- Bring the cursor onto the pad that you want to select with DEAL/DRAW and CHANGE buttons.
- Simultaneously press both buttons.

To test or calibrate a touch screen:

- Select TOUCH SCREEN on the Diagnostic Menu. See *Touch Screen,* in this chapter.



NOTICE

Your GD's sound call addresses may vary from the address examples that appear below.

Sound

Touch SOUND to display the Sound Window. This window enables you to adjust GD sound volume and test the sound hardware.

Sound Samples

The Sound Window contains four sound sample buttons...

- LOW TONE
- WARNING TONE
- HIGH TONE
- NOISE TONE

Touch LOW TONE, WARNING TONE or HIGH TONE for a test sound. The LOW TONE, WARNING TONE and HIGH TONE buttons each test one audio frequency band. The system should reproduce all sounds at about the same volume. *Listen for volume changes, distortion, missing sounds or intermittent sounds.*

Touch NOISE TONE, and the GD outputs noise across all audio bands. *Listen for an absence or unusual emphasis of high, low or midrange sound.*

Volume

Notice the two-pointed, "MASTER VOLUME" arrow below the sound sample buttons. Between the arrows is a slider box. Use the arrows and slider to set the GD's non-award sound volume. You can move the slider through the volume range of zero to 255...

- Touch the right arrowhead to raise the level in small steps.
- Touch the left arrowhead to reduce the level in small steps.
- Touch the arrow body beside the slider to change the volume in large steps.
- Drag the slider right to smoothly increase sound volume.
- Drag the slider left to smoothly reduce sound volume.

Award Volume

Touching Award Volume adds two sliders to the Volume Window...

- LARGE AWARD VOLUME
- TOP AWARD VOLUME

The MASTER VOLUME slide control that we described above continues to function the same way. The other two sliders operate in the same manner as the MASTER VOLUME slider. Use the other two sliders to raise or reduce the sound volume during awards.

Sound Call

Touch SOUND CALL to display a numeric keypad. This keypad allows you to test sounds at various EPROM locations by entering addresses. Typical addresses appear in the table *Sound Call Test.* Depending on which sound EPROMs it uses, your machine may include sounds at these addresses. As you may have guessed, sound calls are primarily factory tests. Yet you can use sound calls to check volume settings and audio hardware performance. Touch keypad keys to enter each digit of an address in decimal notation. Touch the arrow to advance to the next digit of the address.

Secure Memory

Touch SECURE MEMORY to display a window with the status of the GD's secure memory. The window indicates secure memory status by the words "PASS" or "FAIL." A secure memory failure requires troubleshooting. Touch EXIT button to leave the SECURE Memory Window and proceed with other tests.

Comm Status

Touching COMM STATUS opens the Comm Status Window. This window contains a read-only section and a loopback test.

Read-Only Section

The Comm Status Window read-only section announces your GD's communication rate and protocol. For example, "Comm = 9600, 8, N, 1." The rate in our example is 9,600 bits per second *(bps).* The protocol is eight bits, no parity and one stop bit. This rate and protocol report depends on results from the most recent loopback test.

Loopback Test

The LOOPBACK TEST checks the GD's communication port on the Backplane Board. This test requires some hardware preparation. Follow this procedure...

- ❑ 1. Find the GD's serial port on the Backplane Board inside the Main Door. The serial port uses a DB9 connector.
- ❑ 2. Connect GD serial port pins 2 and 3 together. Or connect the GD to a terminal (or a PC running a terminal program).
- ❑ 3. Touch LOOPBACK TEST to initiate the test. If you have a printer machine, the GD prints alphanumeric characters. The GD screen reports the message "Comm = 2400, 8, N, 1."
- ❑ 4. Touch EXIT to quit the test.

I/O

I/O Test options allow you to test GD switches. This submenu includes these I/O (Input/Output) tests...

- CURRENCY
- INPUT
- OUTPUT
- DOOR
- MECHANCIAL METERS

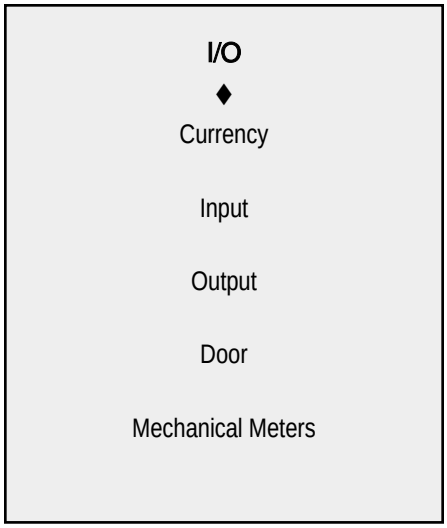
NOTICE

WHERE IS THE MAIN DOOR?

Diagnostic messages refer to the "Main Door."

In Slant Top Video machines, the Main Door is the Electronics Door.

In upright machines, the Main Door is the Front Door.



NOTICE

The GD identifies US coins as "A." Canadian coins are "B."

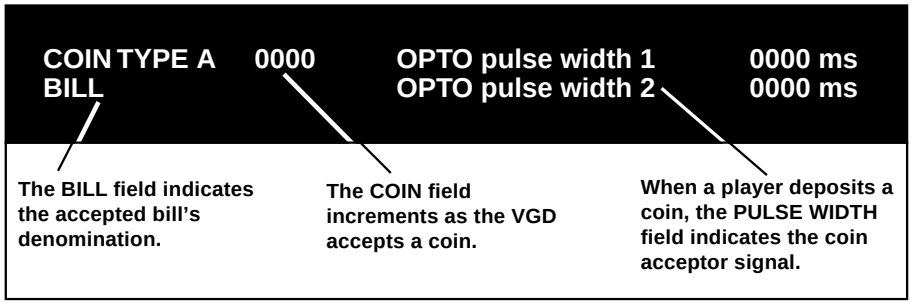
- CC16 and CC40 mechanisms accept US coins.
- NRI mechanisms accept Canadian coins.
- Mars validators accept U.S. bills.
- You can set JCM validators to accept either US or Canadian currency.

Currency

The CURRENCY Test checks coin and bill validators. Initiate this test by touching the CURRENCY screen button. Now select the type of coinand bill acceptors installed in your GD...

• CC16 • CC40 • NRI

A new window opens. An example of the fields in this window appears


COIN TYPE A 0000
BILL
OPTO pulse width 1 0000 ms
OPTO pulse width 2 0000 ms
The BILL field indicates the accepted bill's denomination.
The COIN field increments as the VGD accepts a coin.
When a player deposits a coin, the PULSE WIDTH field indicates the coin acceptor signal.

below...

Insert a valid coin into the coin slot. The window should increment the coin count. The window should also record the pulse width of the acceptor coin deposit signal.

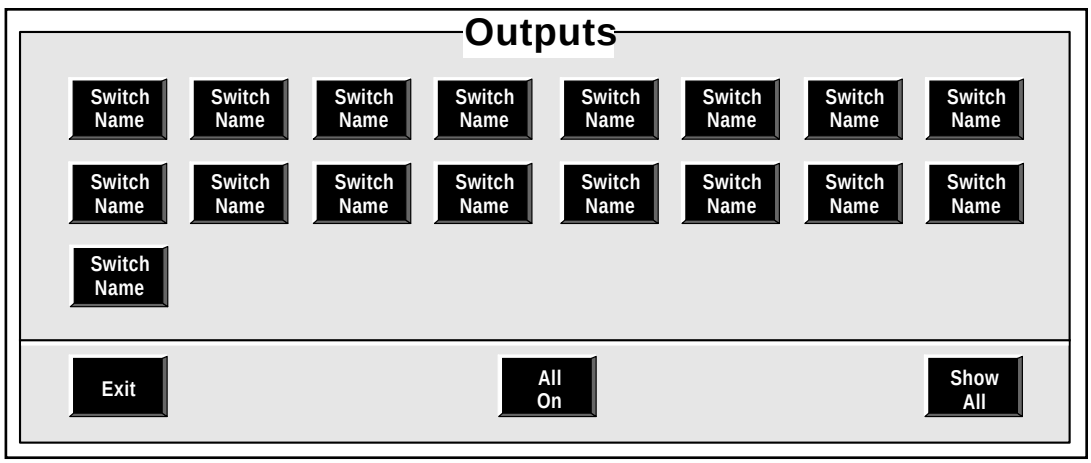
Insert a valid dollar bill. The window should indicate the bill denomination: "ONE." Insert a valid five-dollar bill. The window should display "FIVE."

Input

Touching INPUT opens a window that lists the GD's input switches and opto detectors. Test a switch by closing it. If the input works, the screen highlights the input's name.

Output

Touching OUTPUT opens a window with a button array. Test an output by touching that output's touch screen button. For example, suppose



Example of the OUTPUT window. Real switch names, such as "PLAY" or "BET 1" will appear on screen buttons. These names tend to vary from model to model.

that you touch the screen button for TOWER. The GD's top lamp should light. It should remain ON until you turn off its screen button.

Door Test

Touching DOOR opens a window that indicates door switch status *(open or closed).* Check door switches by pushing and releasing each switch. As you open a door, the screen highlights the corresponding door name. Touch LATCHES *(on the screen)* to maintain an "on" condition across any closed switch.

NOTICE

CASH DOOR constantly appears closed on the Door Test. Current hardware has no application for this switch. The Door Test includes CASH/DOOR solely for expansion purposes. VGDs with a bill acceptor require a CASH/DOOR switch.

Mechanical Meters

Touching MECHANICAL METERS opens a new window. The window has two buttons: NORMAL +10 and FORCE +1.

NORMAL +10

Touch NORMAL +10 if you desire to increment mechanical meters by 10 (as in Game Mode). A meter-selection window opens. Use buttons in this window to select which meters that you want to test. Then press EXIT. *This is the NORMAL +10 sequence...*

1. The "METER OK" signal measures high.
2. The GD applies current to the meter.
3. The "METER OK" signal drops low.
4. The GD interrupts current to the meter.

FORCE +1

Touch FORCE +1 if you desire to increment meters by 1. FORCE +1 doesn't test the "METER OK" signal. Instead, FORCE +1 applies a current pulse to the meter. A meter-selection window opens. Use buttons in this window to select which meters that you want to test. Then press EXIT. If FORCE +1 works and NORMAL +10 doesn't, then the "METER OK" signal is faulty.

History

History

Touching HISTORY opens an event log window. This window records event messages. *Here are some conditions that invoke event messages...*

- TOUCH SCREEN MALFUNCTION
- CORRUPT MEMORY
- POWER ON RESET
- DOOR ACCESS
- CASH OUT

Touch HISTORY to *review these events.* The program also provides event dates and times. Touch EXIT to return to the main window.

Notes

Chapter 3. Auditing, Diagnostic and Adjustment Software

Your GD's game software audits game play statistics and diagnoses GD problems. This software also helps you to adjust game features and performance. You can access GD auditing, diagnostic and adjustment functions from the Administration Mode. There are two Administration Mode menu systems...

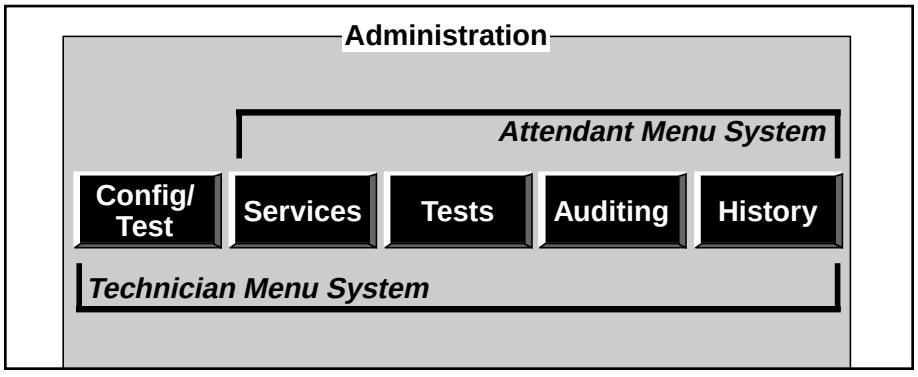
- ***Attendant Menu System***—for use by retailers
- ***Technician Menu System***—for use by authorized personnel

Except for the Config/test Menu, the Technician Menu System is identical to the Attendant Menu System. Accessing the Attendant Menu System involves lower security, and requires fewer steps. *We discuss the Attendant Menu System later in this chapter.*

Technician Menu System

To access the Technician Menu System, open the GD's Main Door. (The Main Door is the Electronics Door on Slant Tops. On upright machines, the Main Door is the Front Door.) Press the white DIAGNOSTIC button inside the door. (STATE LOTTERY MACHINES: Access the Technician menu system by turning the Technician Key.)

The screen displays the Administration Window, which includes five menu buttons.



The Technician Menu System has five parts. To activate a menu selection, touch the selection on the screen. *Notice the Config/Test option in the illustration...*

Each button opens submenus. When the Administration Window appears, you can activate any submenu in two ways...

- Touch the submenu's screen button *(menu pad).*
- If the touch screen doesn't operate, use player panel buttons to move the cursor. See "*Dead Touch Screen?"* on page 3-3.

NOTICE

WINDOW PRIORITY. When you open a window, you activate its buttons and deactivate all the others. To close the window, touch its EXIT, CANCEL or OK button. Then the previous window activates. If a window doesn't have these buttons, close it by touching the previous window.

STATE LOTTERY MACHINES: ADMINISTRATOR AND TECHNICIAN KEYS function similarly. For simplicity, this manual usually specifies the ADMINISTRATOR KEY.

KEY PRIVILEGES. You can access ADMINISTRATOR KEY functions with either the ADMINISTRATOR KEY or the TECHNICIAN KEY. The ADMINISTRATOR KEY additionally allows changes to the Configuration/ Test Features.

NOTICE

In Administration Mode, you'll see a cursor whenever you touch the screen.

NOTICE

In this manual, switch or button names appear in CAPITAL letters. For example, this manual often instructs you to "press DIAGNOSTIC." DIAGNOSTIC is the DIAGNOSTIC button behind the Main Door.

NOTICE

Touch EXIT to close a window and save your setting(s).

NOTICE

Some Config/Test options are theme specific and may or may not be available in your game.

Config/Test Menu

▼

Game Options

General Toggles

Limit Options

Bill Validator Options

Play Speed Options

Poker Toggle Options

Hopper Test Options

Choose Protocol Options

Terminal Address Options

Slot Toggles

Sound Volume

Meter Lamp Activation

Printer Options

Paper Options

Ticket Options

NOTICE

Some Menu Options may not apply to your game.

NOTICE

Jurisdiction regulations determine which menu options appear.

Example of the BACKGROUND COLORS window. Real game names, such as "BLACKJACK" will appear on screen buttons. These names tend to vary from model to model.

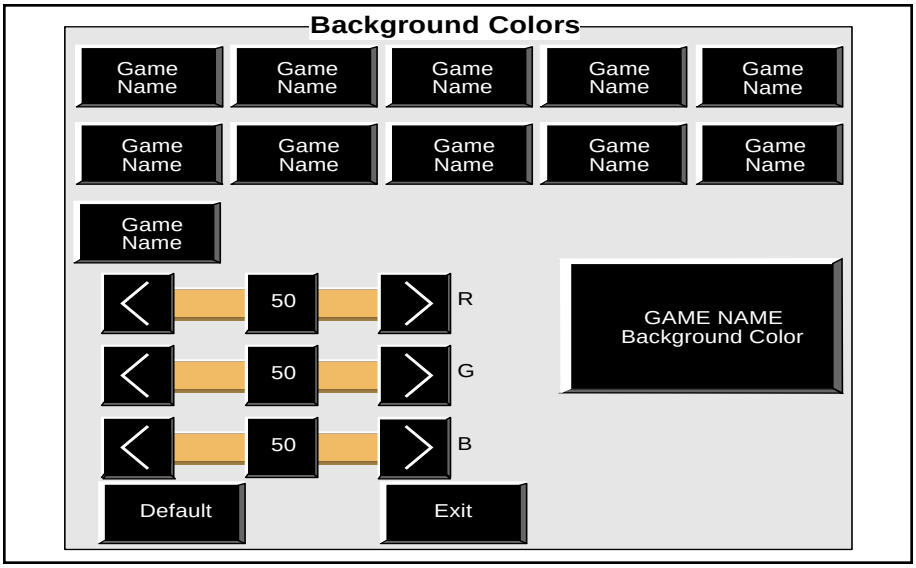
Config/Test Menu

Game Options

Background Colors

Touch BACKGROUND COLORS to open its window. This window contains buttons for all games, and controls for red, green and blue levels. To set a game's background screen color, follow these steps...

- ❑ 1. Touch a game-name button *(for example, JACKS OR BETTER).*
- ❑ 2. Touch the DEFAULT button. The CURRENT indicator changes to the color of the DEFAULT screen background.
- ❑ 3. To specify a custom color background, move the R, G and B sliders as desired. (R stands for red, B for blue, G for green.) You can move each slider in various ways...
  - Touch the right arrowhead to *increase color saturation in* small *steps*.
  - Touch the left arrowhead to *reduce color saturation in* small *steps*.
  - Touch the arrow body beside the slider to *change color saturation in* large *steps*.
  - Drag the slider right to *smoothly increase color saturation*.
  - Drag the slider left to *smoothly reduce color saturation*.
- ❑ 4. Look at the BACKGROUND COLOR indicator box to see the effect of your changes. (The game name of the current game also appears in this box.)
- ❑ 5. If you want to adjust other game color backgrounds, proceed.
- ❑ 6. Touch EXIT to *save your settings and exit to the Config / Test Menu.*



Game Selection
Touch GAME SELECTION. A window opens. This window allows you to enable or disable any of the machine's games. *(The feature only applies to multi-game machines.)* Touch EXIT to *close the window and save your setting.*

Choose Double-Ups
Touch CHOOSE DOUBLE UPS. A window opens. This window allows you to enable or disable the double-up feature. Touch EXIT to *close the window and save your setting.*

Game Percentage
(This feature may not apply to your GD.) Touch GAME PERCENTAGE. A window opens. This window allows you to view or change the winning percentage. Until you insert a special chip into the CPU Board, this window operates in Read-Only Mode. Read-Only Mode disables this window's buttons. Touch EXIT *to close the window.*

To set the game percentage, follow this procedure...

- ❑ 1. Switch off the gaming device at the PDU.
- ❑ 2. Insert the game percentage chip in socket XU27.
- ❑ 3. Switch on GD power at the PDU. The GAME PERCENTAGE window opens.
- ❑ 4. Press the onscreen button to increase the percentage. Or repeatedly press the button to loop through percentages. (The new percentage appears on your monitor.)
- ❑ 5. The Game Percentage Window has no EXIT button. Turn off the GD at the PDU to save your setting.
- ❑ 6. Remove the percentage chip from socket XU27.
- ❑ 7. Switch on GD power at the PDU.
- ❑ 8. The tilt "Secure Memory Options Updated" appears. Clear it by turning the ADMINISTRATOR KEY.
- ❑ 9. Review your changes.
- ❑ 10. Close and lock the Card Cage and Electronics Door.

Max Bet
Touch GAME SELECTION. A window opens. This window allows you to view or set the Max Credit Bet per line. Touch EXIT *to close the window.*

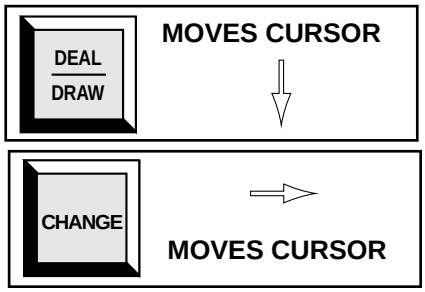
General Toggle Options

Banner/Credits (Multi Game Only)
Touch ON to enable the BANNER/CREDITS feature, or OFF to disable it. Enable BANNER/CREDITS to display the banner that you entered in the Services Menu. Disable this feature to hide the banner. With the banner disabled, the GD alternately displays standard message headers: "Insert Credits" or "Select Game."

Dead Touch Screen?

To move the cursor-10-button game:

- DEAL/DRAW (or PLAY) button moves the cursor down. When the cursor reaches the screen's bottom edge, the cursor wraps around.
- CHANGE (or BET ONE) button moves the cursor horizontally, toward your right. When the cursor reaches the right screen edge, the cursor wraps around.



To move the cursor-12-button game:

- 3-LINES button moves the cursor down. When the cursor reaches the screen's bottom edge, the cursor wraps around.
- CHANGE or 5-LINES button moves the cursor horizontally, toward your right. When the cursor reaches the right screen edge, the cursor wraps around.

To make a selection (both games):

- Turn the ADMINISTRATOR KEY to enter Administration Mode.
- Bring the cursor onto the pad that you want to select with DEAL/DRAW and CHANGE buttons.
- Simultaneously press both buttons.

To test or calibrate a touch screen:

- Select TOUCH SCREEN on the Diagnostic Menu. See *Touch Screen,* in this chapter.

Force Credit Mode
Touch ON to enable the FORCE CREDIT MODE feature, or OFF to disable it. *Enabled:* Wins go to the Credit Meter. *Disabled:* The CASH/CREDIT button toggles between Cash Mode and Credit Mode. Cash Mode pays wins from the hopper. Credit Mode credits wins on the Credit Meter.

Casino Rebet
Touch ON to enable the CASINO REBET feature, or OFF to disable it. CASINO REBET allows the PLAY or DEAL button to enable or disable the rebet feature. *Enabled:* Players continue betting by pressing PLAY or DEAL. *Disabled:* Players must set the bet amount before playing.

- Touch EXIT to *close the General Toggles Window and save your settings.*

Blackjack Toggle Options
(Only on some GDs.) Enable or disable play features.

Limit Options

Credit Limit (Credits)
Touch CREDIT LIMIT. A numeric keypad appears on the screen. The keypad is used to vary the credit limit amount.

CREDIT LIMIT selects the maximum credits that the player may have on the GD's credit meter. The player can store a credit amount that can exceed the HOPPER LIMIT setting. The player is able to continue game play from the credit meter without having a hopper payout after each winning occurrence.

Jackpot Limit (Credits)
Touch JACKPOT LIMIT. A numeric keypad appears on the screen. The keypad is used to vary the credit limit amount.

JACKPOT LIMIT allows the player to store a large credit win value to the credit meter. This limit must be always less than or equal to the CREDIT LIMIT. Any jackpot win lower than the JACKPOT LIMIT but will cause the credit meter to exceed the CREDIT LIMIT, will result in a jackpot handpay situation.

Hopper Limit (Coins)
Touch HOPPER LIMIT. A numeric keypad appears on the screen. The keypad is used to vary the jackpot limit amount.

HOPPER LIMIT selects the maximum number of coins/tokens that the hopper can dispense whenever the the player wants to cash out credits. The credits over the HOPPER LIMIT result in a handpay situation. HOPPER LIMIT doesn't affect the number of coins paid out for the top award.

A jackpot win that equals or exceeds the JACKPOT LIMIT triggers a hand-pay event. (An attendant must pay this amount.) The hand pay equals the difference between the win and the JACKPOT PARTIAL PAY amount.

Jackpot Partial Pay (Credits)

Touch JACKPOT PARTIAL PAY. A numeric keypad appears on the screen. The keypad is used to vary the JACKPOT PARTIAL PAY amount.

JACKPOT PARTIAL PAY selects how much is credited to the credit meter during a jackpot. The remaining portion of the jackpot is handpaid by an attendant. The monitor indicates the amount credited and the amount to be handpaid.

- Select “0000” to *permit* no *partial payout.* Your choice appears on the monitor.
- Touch EXIT to *close the Jackpot Partial Pay Window and save your setting.*

Bill Validator Options

Touch BILL VALIDATOR. A window with the names of seven bill types opens.

- Touch ACCEPT beside each bill name that you want the GD to accept.
- Touch REJECT beside each bill name that you want the GD to reject.
- Touch EXIT to *close the window and save your settings.*

Play Speed Options

Touch PLAY SPEED. A window with five buttons opens. Three buttons affect game speed *(slow, medium or fast).* Touch a button to select card-dealing speed in card games. The buttons also affect the reel-spinning speed in reel games.

- Touch PLAYER ADJUSTABLE to *permit players to choose game play speed.*
- Touch EXIT to *close the window and save your setting.*

Poker Toggle Options

Touch POKER TOGGLES to adjust poker game play. A window with two buttons opens...

Hold/Discard

A player touches a card after the initial deal: Shall the GD hold or discard the card? Touch HOLD to enable the GD to hold the card. Touch DISCARD to enable the GD to discard the card.

Auto Hold

The GD can suggest cards that the player should hold after the deal: The word "HOLD" appears above suggested hold cards. Also, a border outlines these cards. AUTO HOLD enables or disables the card-holding suggestion. Touch ON to enable, or OFF to disable the AUTO HOLD function. *(Your GD may not support this feature.)*

Highlight Intermediate Pays

Touch ON to highlight, or OFF to remove highlights from, the paytable's intermediate payout listings. (The machine highlights the pay listing by outlining it.)

- Touch EXIT to *close the POKER TOGGLE OPTIONS window and save settings.*

Hopper Test Options ***(only on Hopper GDs)***

Touch HOPPER to open the Hopper Test Window. Put at least 40 coins in the hopper for this test. During the test, the monitor counts coins paid out. *The Hopper Test checks the...*

- HOPPER DRIVE CIRCUITRY
- HOPPER MOTOR
- MOTOR BRAKE
- COIN-OUT PROXIMITY SENSOR

The I/O Board enables the hopper driver, a solid state relay *(SSR).* The SSR switches on the hopper motor and releases the brake.

- Touch ONE COIN or 10 COINS to *test the hopper's ability to dispense coins.* The hopper responds by dispensing a coin or coins. A coin-out sensor detects each coin leaving the hopper. The sensor transmits this information back to the CPU Board. If the hopper fails to dispense coins, the hopper stops.

- Touch SHUT OFF HOPPER to *disable the hopper motor and engage the brake.* The CPU responds by deactivating the SSR. The SSR switches off the hopper motor and applies the brake.

- If the hopper fails to dispense coins, the hopper stops.

- Touch EXIT to *leave the Hopper Test Window.*

NOTICE

You must set protocol options before you can set the terminal address.

Choose Protocol Options

Touch CHOOSE PROTOCOL OPTIONS. A window opens. Touch one of the buttons inside this window to set your machine's communications protocol. Your machine uses this protocol for GD-to-host

communication. The host must employ the same protocol that you've set for your GD. To close the window and save your setting, touch EXIT.

Terminal Address Options

Touch TERMINAL ADDRESS to display a window with a numeric keypad. Touch keypad keys to enter each digit of an address in decimal notation. Your machine uses this three-digit, SAS plus address during GD-to-host communication. Touch the arrow to advance to the next digit of the address. Allowable addresses range between zero and 127. You must set protocol options before you can set the terminal address. To close the window and save your setting, touch EXIT.

Sound Volume

Touch SOUND to display the Sound Window. This window enables you to adjust GD sound volume and test the sound hardware.

Diagnostics

The SOUND window contains four sound sample buttons...

- LOW TONE
- HIGH TONE
- WARNING TONE
- NOISE TONE

Touch LOW TONE, WARNING TONE or HIGH TONE for a test sound. The LOW TONE, WARNING TONE and HIGH TONE buttons each test one audio frequency band. The system should reproduce all sounds at about the same volume. *Listen for volume changes, distortion, missing sounds or intermittent sounds.*

Touch NOISE TONE, and the GD outputs noise across all audio bands. *Listen for an absence or unusual emphasis of high, low or midrange sound.*

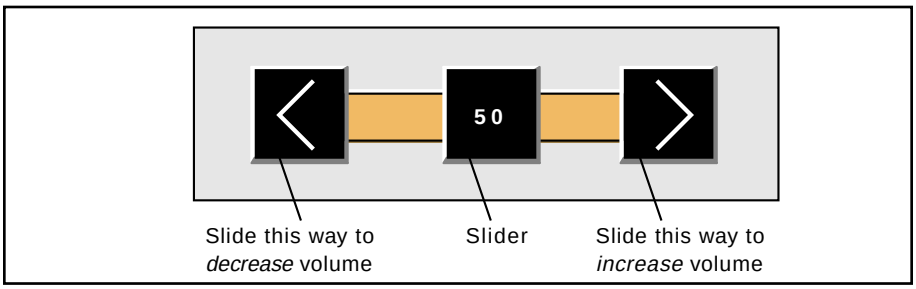
Master Volume

Notice the two-pointed, "MASTER VOLUME" arrow below the sound sample buttons. Between the arrows is a slider box. Use the arrows and slider to set the GD's non-award sound volume. You can move the slider through the volume range of zero to 255...

- TOUCH THE RIGHT ARROWHEAD TO RAISE THE LEVEL IN SMALL STEPS.
- TOUCH THE LEFT ARROWHEAD TO REDUCE THE LEVEL IN SMALL STEPS.
- TOUCH THE ARROW BODY BESIDE THE SLIDER TO CHANGE THE VOLUME IN LARGE STEPS.
- DRAG THE SLIDER RIGHT TO SMOOTHLY INCREASE SOUND VOLUME.
- DRAG THE SLIDER LEFT TO SMOOTHLY REDUCE SOUND VOLUME.

Sound Call

Touch SOUND CALL to display a numeric keypad. This keypad allows you to test sounds at various EPROM locations by entering addresses. Typical addresses appear in the table *Sound Call Test.* Depending on which sound EPROMs it uses, your machine may include sounds at these addresses. As you may have guessed, sound calls are primarily factory tests. Yet you can use sound calls to check volume settings and audio hardware performance. Touch keypad keys to enter each digit of an address in decimal notation. Touch the arrow to advance to the next digit of the address.



A Sound Volume Slider from the Sound Window

Award Volume

Touching Award Volume adds two sliders to the VOLUME window...

- LARGE AWARD VOLUME
- TOP AWARD VOLUME

The MASTER VOLUME slide control that we described above continues to function the same way. The other two sliders operate in the same manner as the MASTER VOLUME slider. Use the other two sliders to raise or reduce the sound volume during awards.

Disable Machine

Touch DISABLE MACHINE to disable the GD. The GD enters Out-of-Service Mode. The screen displays an out-of-service banner. To exit, press the white DIAGNOSTIC button.

Meter Lamp Activation

(Only on some upright GDs.) Touch METER LAMP ACTIVATION to open this feature's window. The GD can use various methods to toggle or disable the meter lamp. This feature selects one such method. Touch on-screen Exit button to return to Config/Test menu.

Printer Options

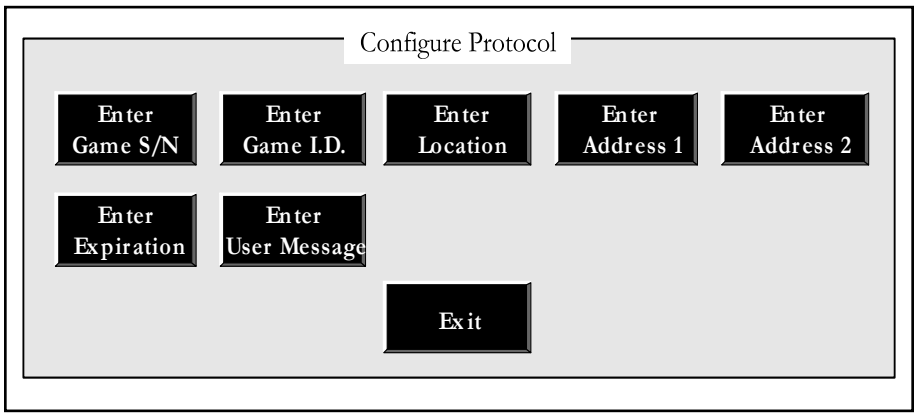
Touch PRINTER OPTIONS to choose the desired printer (such as the Ithaca Model 750 thermal printer or the Ithaca Model 70 dot matrix printer). Touch on-screen Exit button to return to Config/Test menu.

Paper Options

Touch PAPER OPTIONS to choose the desired paper (short size 120mm or bill size 155mm). Touch on-screen Exit button to return to Config/Test menu.

Ticket Options

Touch TICKET OPTIONS then the CHOOSE PROTOCOL button to select the the appropriate central system protocol that the game will use. To configure the printer ticket verification protocol, select CONFIGURE PROTOCOL (see diagram below) from TICKET OPTIONS. Enter your information into the appropriate locations.Touch on-screen Exit button to return to Config/Test menu.



Exit

Press DIAGNOSTIC button to save settings and close Config/Test window.

Exit

Services Menu

Services Menu

▼

Automatic Test

Set Clock

Disable VLT

Revision

Banner

Automatic Test

Touch AUTOMATIC TEST to sequence the GD through several tests. Automatic Test Mode enables you to continuously test GD hardware. Select tests. Then touch GO! The GD sequences through the tests you've chosen...

- **Output Tests:** The GD lights lamps and checks switch status.
- **Sound Tests:** The GD produces sounds to test audio hardware.
- **Video Tests:** *(Refer to your monitor manual)***...**
  - Palette *(color bars)* helps you assess gun adjustment.
  - Convergence: Crosshatch pattern helps you assess alignment, convergence.
  - Purity screens...
    • Red • Green • Blue • White
- **Printer Test:** *(Only on printer machines)* The GD prints a test ticket with symbols and a logo. *The GD repeats Auto Cycle Mode tests until you touch EXIT.* If the tests identify problems, the screen displays error messages. Touch EXIT to return to the Services Window.

Revision

Touch REVISION to display the software version. REVISION also displays the GD's terminal number.

Set Clock

The SET CLOCK button allows you to change the system date and time. Touch SET CLOCK.

Date

Use the arrows to position the cursor in the date display. Use the onscreen keypad to enter the correct date (MMDDYY). Then touch the OK button. The window closes.

Time

Use the arrows to position the cursor in the time display. Use the onscreen keyboard to enter the time in 24-hour form. Then touch the OK button. The window closes.

Banner (Multi Game Only)

Touch BANNER to enter the banner phrase for the GD to display. Enter the message by touching keys on the alphanumeric keypad screen. Then press OK or CANCEL.

Exit

Exit

Press DIAGNOSTIC button to save settings and close Services window.

Tests Menu

▼

I/O

Printer

Video

Touch Screen

Sound

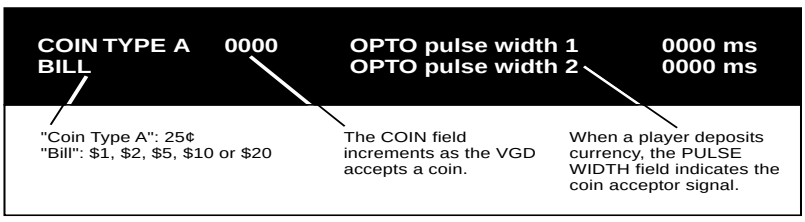
Comm Status

Tests Menu

I/O

Touch I/O to open the I/O Test Window. I/O Test options allow you to test GD switches. The I/O Test Submenu includes four I/O (Input/Output) tests...

• Currency • Input • Output • Door Test

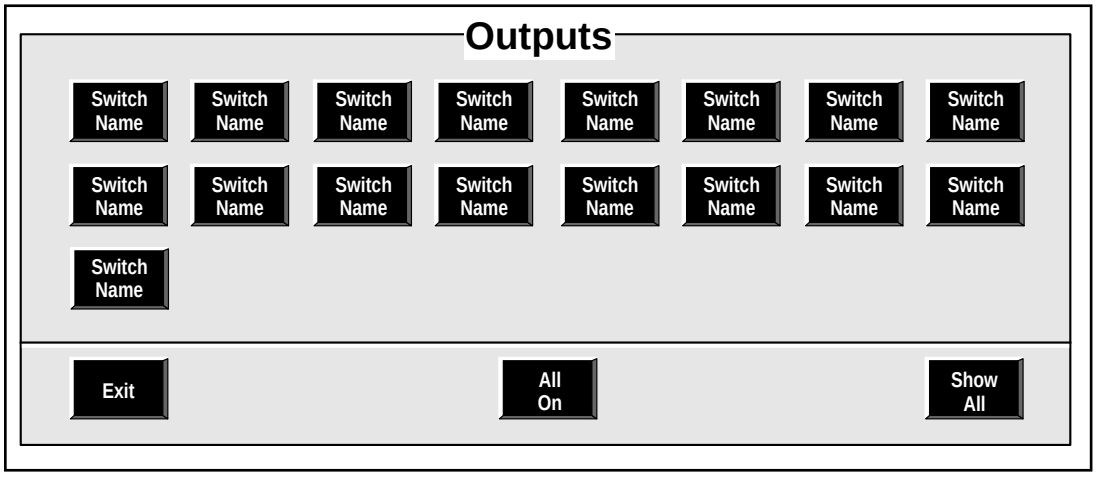

COIN TYPE A
BILL
0000
OPTO pulse width 1
OPTO pulse width 2
0000 ms
0000 ms
"Coin Type A": 25¢
"Bill": $1, $2, $5, $10 or $20
The COIN field increments as the VGD accepts a coin.
When a player deposits currency, the PULSE WIDTH field indicates the coin acceptor signal.

If a test fails, troubleshoot the indicated switch circuit. Identify and repair the problem.

Currency Test
Touch CURRENCY TEST for coin acceptor tests. A new window opens. An example of the fields in this window appears below...
Insert a valid coin into the coin slot. The window should increment the coin count. The window should also record the pulse width of the acceptor coin deposit signal.

Bill Validator *(BV)* Test
Touch DBV TEST for bill validator tests. A new window opens. Insert a $1, $2, $5, $10, $20, $50 or $100 bill into the BV slot. The GD displays the bill denomination.

Input
Touching INPUT opens a window that lists the GD's input switches and opto detectors. Test a switch by closing it. If the input works, the screen highlights the input's name.



Example of the OUTPUT window. Real switch names, such as "PLAY" or "BET 1" will appear on screen buttons. These names tend to vary from model to model.

Output
Touching OUTPUT opens a window with a button array. Test an output by touching that output's touch screen button. By touching its button, you can turn an output on or off. Touch ALL ON to to toggle all switches on. Touch ALL OFF to toggle them off again. Touch SHOW ALL to view the lamp matrix layout. (In the matrix layout, "R" stands for *lamp row,* and "C," for *lamp column).*

Door Test
Touch DOOR for a door status display *(open or closed).* Check door switches by pushing and releasing each switch. As you open a door, the screen highlights the corresponding door name. Touch LATCHES *(on the screen)* to maintain an "on" condition across any closed switch.

CAUTION

Print several receipts before closing the main door. *Otherwise receipts may jam later.*

Printer *(Optional on some GDs)*

Touch PRINTER to open the Printer Test Window. This window enables you to print tickets with a bar code and test characters. To print one ticket, touch PRINT 1 TICKET. To print 20 test tickets, touch PRINT 20 TICKETS. To print continuously, touch PRINT CONTINUOUS. To stop continuous printing, touch EXIT.

If the printer doesn't work, check or swap the printer-to-CPU Board cable.

NOTICE

MONITOR ADJUSTMENT KNOBS. The exact adjustment knob location depends on the type of monitor provided with the GD.

Video

Touch VIDEO for assistance with monitor adjustments. *(For more on these adjustments, consult your monitor manual.)* VIDEO includes these options...

Palette *(Color Bars)*
Touch PALETTE to display a color bars screen. This screen simplifies color gun adjustments.

Convergence *(Crosshatch Pattern)*
Touch CONVERGENCE to display a crosshatch pattern. Use this pattern during convergence and raster positioning. The crosshatch pattern also helps during raster height and width adjustments.

Purity Screens
Touch RED, GREEN, BLUE or WHITE to display a solid-color purity screen. Purity screens help during purity magnet adjustments, relative gun output tests, degaussing and rejuvenation. Use the white screen for color temperature testing.

Touch Screen

Touch TOUCH SCREEN to adjust or verify screen calibration. TOUCH SCREEN opens a window with two buttons: TOUCH CAL and TOUCH TEST.

Is calibration so poor that you can't activate the Touch Screen Test from the screen? Press and hold the CHANGE button. Simultaneously turn the ADMINISTRATOR KEY switch. The GD automatically enters the TOUCH CAL option.

Touch Cal
Touch TOUCH CAL to open its window. TOUCH CAL matches cursor position to touch position. Touch the number 1 in the window's bottom left corner. A new window replaces the first. Touch the number 2 in the window's top right corner. The screen calibrates to your touch. Then the Tests Menu returns.

Touch Test

Touch TOUCH TEST to open its window. TOUCH TEST reveals how well the cursor tracks finger movement. Touch several screen locations. Notice the "Down" and "Lift" coordinates in the window's bottom left corner. These report where your finger touched and rose off the screen. The "Drag" coordinates define where your finger currently rests on the screen.

Sound

Touch SOUND to display the Sound Window. This window enables you to adjust GD sound volume and test the sound hardware.

Diagnostics

The SOUND window contains four sound sample buttons...

- LOW TONE
- HIGH TONE
- WARNING TONE
- NOISE TONE

Touch LOW TONE, WARNING TONE or HIGH TONE for a test sound. The LOW TONE, WARNING TONE and HIGH TONE buttons each test one audio frequency band. The system should reproduce all sounds at about the same volume. *Listen for volume changes, distortion, missing sounds or intermittent sounds.*

Touch NOISE TONE, and the GD outputs noise across all audio bands. *Listen for an absence or unusual emphasis of high, low or midrange sound.*

Sound Call

Touch SOUND CALL to display a numeric keypad. This keypad allows you to test sounds at various EPROM locations by entering addresses. Typical addresses appear in the table *Sound Call Test.* Depending on which sound EPROMs it uses, your machine may include sounds at these addresses. As you may have guessed, sound calls are primarily factory tests. Yet you can use sound calls to check volume settings and audio hardware performance. Touch keypad keys to enter each digit of an address in decimal notation. Touch the arrow to advance to the next digit of the address.

NOTICE

Your GD's sound call addresses may vary from the address examples that appear below.

Sound Call Examples

Sound	Address
Alert, Diagnostic	980
Bang, End	121
Bang, Start	122
Beep 1	985
Beep 2	986
Bet, Credit	110
Bet, Max	112
Credit Bill-In	103
Button, Toggle On	119
Button, Toggle Off	120
Chime, Call Attendant	115
Click, Button	160
Coin-In	101
Coin-Out, Bonus	109
Credit, Reached Max	111
Entry, Game	154
Entry, Help	150
Escape	983
Exit, Game	151
Exit, Help	152
Help, More	153
Play	116
Reject, Coin	117
Speed, Game 1	161
Speed, Game 2	162
Speed, Game 3	163
Spin, Reel	104
Tilt	118
Warning	984

Comm. Status

Comm. Status provides a real-time display of communications between the host system and GD. *(The feature only applies to state lottery gaming devices and diagnostic software.)*

Exit

Press DIAGNOSTIC button to save settings and close Tests window.

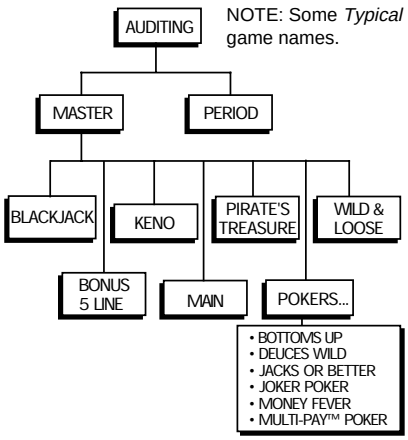
Exit

Auditing Menu

▼

→ Master

Period



NOTICE

See the Auditing Menu block diagram above. The diagram indicates options in the Auditing, Master and Pokers windows. The Period Window contains the same options as you'll find in the Master Window. Period Window buttons permit you to print *or reset* meters. Master Window buttons *only* permit you to print meters.

The block diagram lists *typical* games. Your GD may include different games. The games on your GD may appear in a different order.

History Menu

▼

Play History

Term. Events

Bill Log

EFT Log

Auditing Menu

Master and Period

Touch MASTER to *view or print* game play data from your GD's soft meters. *(To print data, your machine must contain a printer.)* Software meters statistically document GD operation...

• COMMUNICATION FAULTS • COIN METER COUNTS • OPEN DOOR COUNTS • TILTS • ETC.

Touch PERIOD to *view, print or reset* this game play data. Except for the additional RESET buttons, PERIOD windows are identical to MASTER windows. For the sake of brevity, this book details only the MASTER windows.

Use Master and Period to View Soft Meters

To view, print or reset "soft" meters in Services Mode...

- ❑ 1. Turn the ADMINISTRATOR KEY.
- ❑ 2. Touch AUDITING.
- ❑ 3. Touch MASTER to *view or print* game play data from your GD's soft meters. Touch PERIOD to *view, print or reset* this game play data.
- ❑ 4. Touch MAIN, or touch the game meter name of your choice.
- ❑ 5. *Printer Machines:* To print the meters, touch PRINT.
- ❑ 6. To reset game meters, touch RESET. (You can *only* reset meters by first touching PERIOD, and then MAIN.)
- ❑ 7. Touch CONFIRM.
- ❑ 8. To save settings and close Auditing window, touch EXIT and press DIAGNOSTIC button or turn the ADMINISTRATOR KEY.

t

History Menu

Touch HISTORY to open a window with four buttons...

Play History

Touch PLAY HISTORY. A window opens. The window logs final game play screens from previous games. Use the log to verify winnings. The software classifies play histories by game.

Touch a button to recall the desired play history. You may choose histories by game name, or you may choose the ALL GAMES button. Each game-name button opens a window for the corresponding game. This window tracks the past five bets for its subject game. The ALL GAMES window details all games over the past five bets.

Term. Events

Touch TERM. EVENTS to obtain a report of any situation that raises an error flag. Here are some events that raise error flags...

- BILL RECALL
- CASH OUT
- CORRUPT MEMORY
- DOOR ACCESS
- POWER ON RESET
- TOUCH SCREEN MALFUNCTION

TERM. EVENTS also provides event dates and times. To scroll the screen data, touch the LATER or EARLIER button.

Printer GDs: You can touch PRINT for a hard copy of Term. Events data.

Bill Log

Touch BILL LOG. A window opens to a Bill Log Listing that shows the type of event, such as “Bill Stacked”, and the date, time, and type of bills.

EFT Log

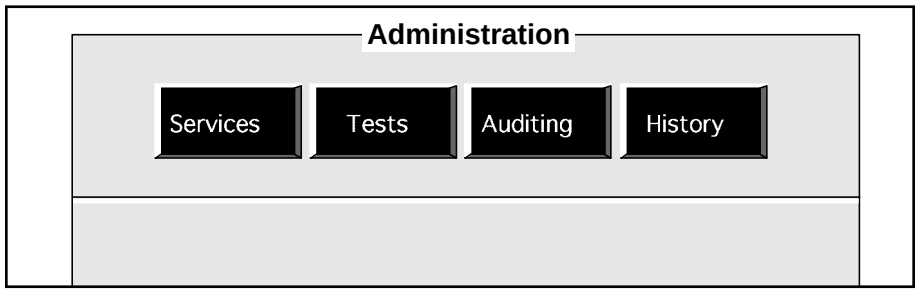
Touch EFT LOG. A window opens to an EFT Log Listing which logs EFT (Electronic Funds Transfer) event transactions and lists value, type, time and date.

Exit

Press DIAGNOSTIC button to save settings and close History window.

Attendant Menu System

Except that it lacks the the Config/Test Menu, the Attendant Menu System is identical to the Technician Menu System. To activate the Attendant Menu System, turn the ADMINISTRATOR KEY switch. You'll find this switch on the side of the cabinet.



The screen displays the Services Window, which includes four menu buttons.

The Attendant Menu System has four parts. Each part includes one or more submenus. When the Services Window appears, you can activate any submenu in two ways...

- Touch the submenu's screen button *(menu pad).*
- If the touch screen doesn't operate, use player panel buttons to move the cursor. See *Dead Touch Screen?* elsewhere in thie chapter.

Exit

Exit

Turn the ADMINISTRATOR KEY to leave the menu system and return to Game Play Mode. To reenter the menu system, use the ADMINISTRATOR KEY again.

Administration Menu System
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Overview

The game operating software audits game play statistics and assists technicians in diagnosing problems with the games operation. This software also helps to adjust game features and performance. Access Game auditing, diagnostic and adjustment functions from the Administration Mode. There are two Administration Mode menu systems:

- Attendant Menu System—for use by retailers
- Technician Menu System—for use by authorized personnel

The Technician Menu System is identical to the Attendant Menu System, except that the Technician Menu also has the Config/Test Menu. Accessing the Attendant Menu System involves lower security, and requires fewer steps. The Attendant Menu System is described later in this chapter.

The screen displays the Administration Window, which includes all five menu buttons.

Each button opens a submenu. When the Administration Window appears, any submenu may be activated in one of two ways:

Touch the submenu's screen button (menu pad).

or

If the touch screen doesn't operate, use player panel buttons to move the cursor. See *Dead Touch Screen?* on page 3-3.

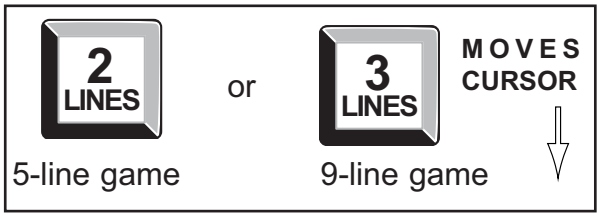
To activate a menu selection, touch the selection on the screen.

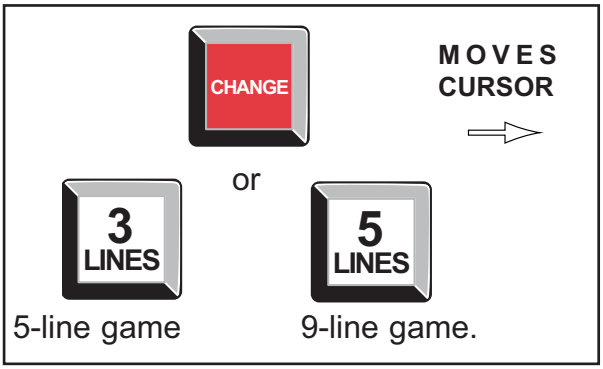
Dead Touch Screen?

To move the cursor on the 12-button game

The second LINE button moves the cursor down. When the cursor reaches the screen's bottom edge, the cursor starts again at the top.

Both the third LINE button and the CHANGE button moves the cursor horizontally to the right. When the cursor reaches the right screen edge, the cursor starts again at the left.





To make a selection:

Move the cursor onto the desired digital button as described above.

Simultaneously press both of the buttons.

Technician Menu System

To access the Technician Menu System, open the Game's Main Door. Press the white DIAGNOSTIC CONFIGURATION TEST SWITCH button inside the door.

The Technician Menu System has the Config/Test option in addition to the four menu options that the Attendant Menu provides.

Config/Test - Game - Game Percentage

The winning percentage can be viewed or changed from the Game Percentage menu. Until a special chip is installed into the CPU Board, the percentage cannot be changed only viewed in this menu.

When the SHOW CRC button is pressed, the percentage display is replaced by the CRC identification number.

Touch EXIT to close the window.

To set the game percentage, follow this procedure immediately following a RAM Clear:

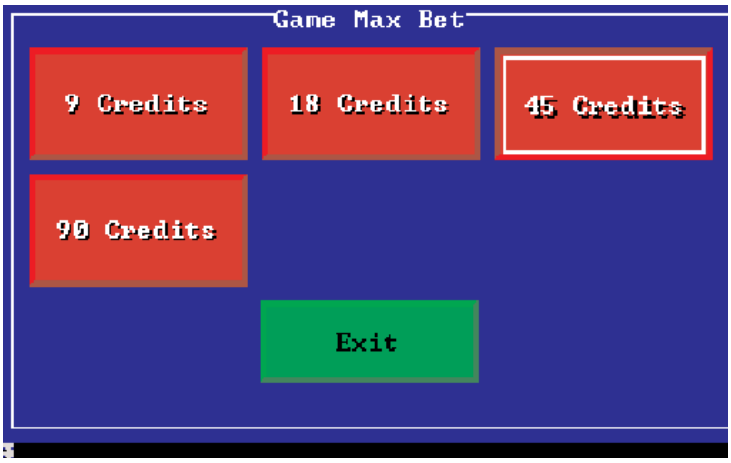
1. Switch off the gaming device at the PDU.
2. Insert the game percentage chip in socket XU27.
3. Switch on Game power at the PDU. The GAME PERCENTAGE window opens.
4. Touch the Theme/Percentage button to select the desired percentage. When the highest percentage is reached it will loop to the lowest percentage.
5. While the Percentage Chip is installed the Game Percentage Window has no EXIT button. Turn off the Game at the PDU to exit and save the setting.
6. Remove the percentage chip from socket XU27.
7. Switch on Game power at the PDU.
8. The tilt “Secure Memory Options Updated” appears. Clear it by turning the ADMINISTRATOR KEY.
9. Review the changes.
10. Close and lock the Card Cage and Electronics Door.

Config/Test - Game - Game Max Bet

The maximum allowable bet may be set in the Game Max Bet window. The choice of selections will vary according to the number of bet lines that particular themes have. Common number of bet lines are 9, 5, and 3. The maximum number of credits per line are typically 1, 2, 5, or 10.

Touch EXIT to close this window.

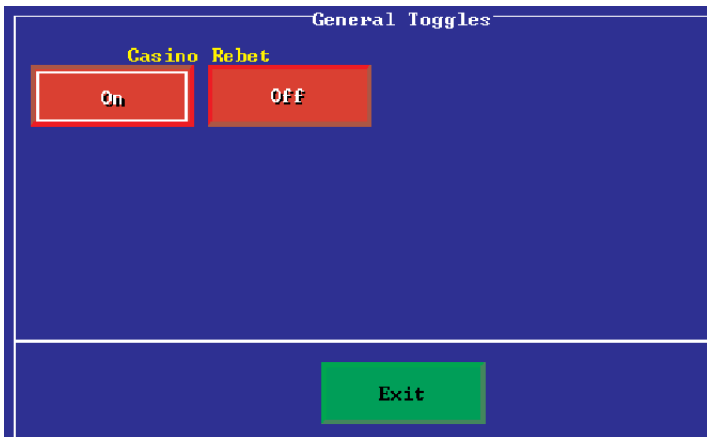
The example shows a nine line game.



Config/Test - Game - General Toggles

As of OS version 2.78 The General Toggles window has only one set of toggles - the *Casino Rebet* feature. When the feature is enabled by selecting ON, it sets the last Player's selections of play lines and credits per line as the default. The feature activates the button SPIN REELS. When the feature is disabled by selecting OFF, the SPIN REELS button is also disabled and players must select the number of lines and coins per line for every bet.

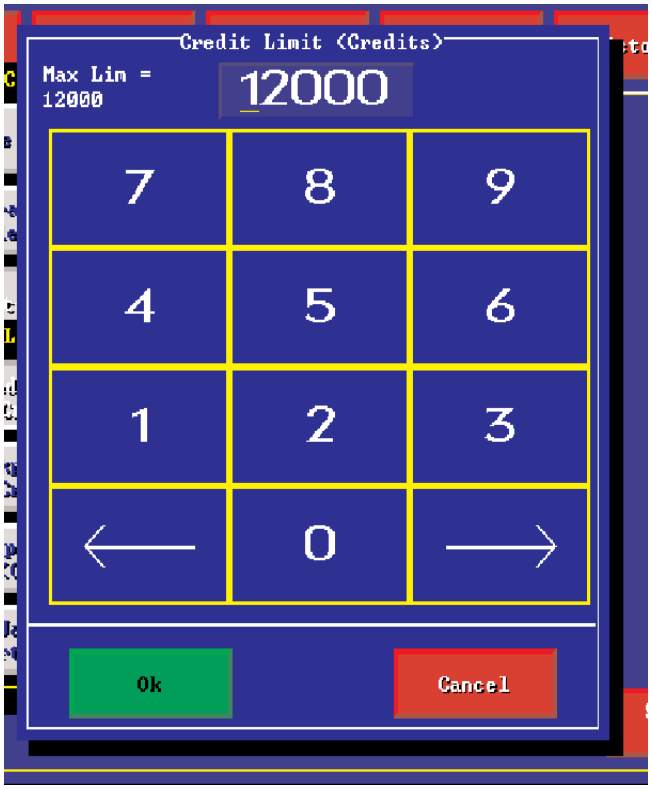
Touch EXIT to close this window.



Config/Test - Limits

There are four *Limit* input screens. All show a numeric keypad and are Identical except for the top title. The keypads are used to vary the limit amounts. Pressing OK saves all changes.

Credit Limit (Credits) selects the maximum credits that the player may have on the Game's credit meter. The player can store a credit amount that can exceed the HOPPER LIMIT setting. The player is able to continue game play from the credit meter without having a hopper payout after each winning occurrence.



Jackpot Limit (Credits) allows the player to store a large credit win value to the credit meter. This limit must be always less than or equal to the CREDIT LIMIT. Any jackpot win lower than the JACKPOT LIMIT but causes the credit meter to exceed the CREDIT LIMIT, will result in a jackpot handpay situation.

Hopper Limit (Coins) selects the maximum number of coins/tokens that the hopper can dispense whenever the the player wants to cash out credits. The credits over the HOPPER LIMIT result in a handpay situation. HOPPER LIMIT doesn't affect the number of coins paid out for the top award.

A jackpot win that equals or exceeds the JACKPOT LIMIT triggers a hand-pay event (an attendant must pay this amount). The hand pay equals the difference between the win and the JACKPOT PARTIAL PAY amount.

Jackpot Partial Pay (Credits) selects how much is credited to the credit meter during a jackpot. The remaining portion of the jackpot is handpaid by an attendant. The monitor indicates the amount credited and the amount to be handpaid.

- Select "0000" to permit *no partial payout*.

Your choice appears on the monitor.

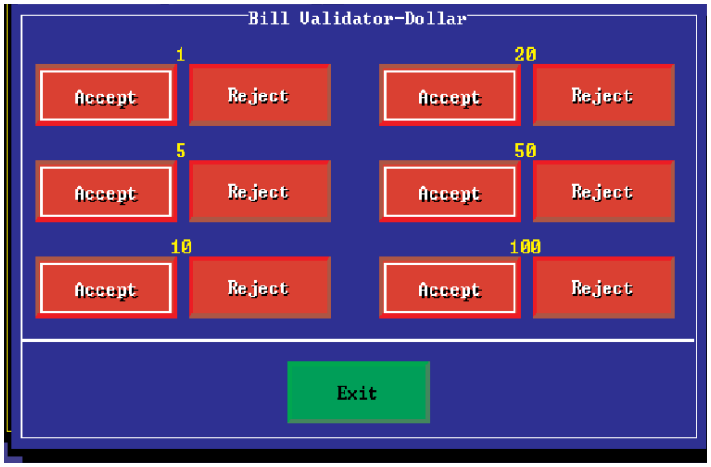
Config/Test - Bill Validator

The Bill Validator window contains the names of different bill types. In the USA there are six.

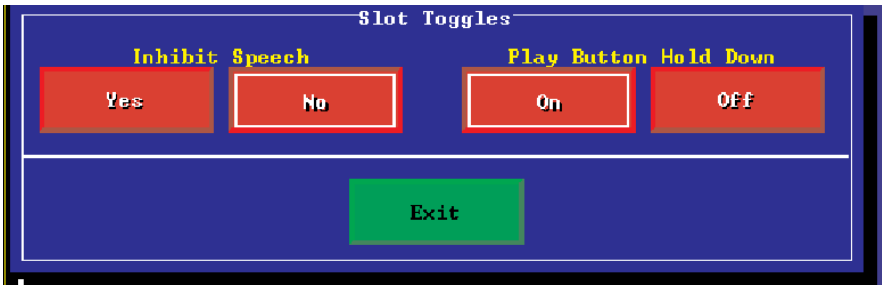
Touch ACCEPT beside each bill name that the Game will accept.

Touch REJECT beside each bill name that the Game will reject.

Touch EXIT to close the window and save the settings.



Config/Test - Slot Toggles



The Slot Toggles window has two sets of toggles.

Inhibit Speech, when activated by pressing YES, will keep the games speech sound tracks from playing during bonus rounds. NO will allow the normal bonus round sound tracks to play.

The *Play Button Hold Down* function when turned ON will allow a player to hold down the button SPIN REELS, causing the game to play continuously until the credit meter runs out or a Jackpot or Bonus Screen is reached. OFF will require the player to wait until the reels stop before the SPIN REELS button is enabled again.

Touch EXIT to close the window and save your settings.

Config/Test - Hopper Tests

The Hopper Tests window is unavailable with printer software.

Put at least 40 coins into the hopper for this test. During the test, the meters count coins paid out. The Hopper Test checks the:

- Hopper Drive Circuitry
- Hopper Motor
- Motor Brake
- Coin-Out Proximity Sensor

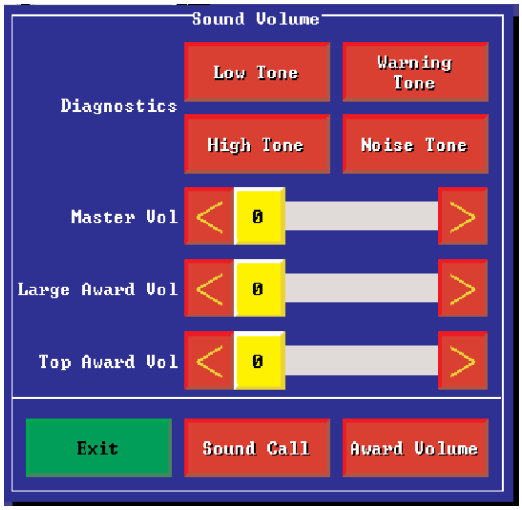
The I/O Board enables the hopper driver, which is a solid state relay (SSR). The SSR switches on the hopper motor and releases the brake.

Touch ONE COIN or 10 COINS to test the hopper's ability to dispense coins. A coin-out sensor detects each coin leaving the hopper. If the hopper fails to dispense coins the hopper will stop.

Touch SHUT OFF HOPPER to disable the hopper motor and engage the brake.

Touch EXIT to leave the Hopper Test Window.

Config/Test - Sound Volume



Sound Volume Window with the Award Volume Sliders shown.

The Sound Volume window enables adjustment to the game's sound volume and test the sound hardware.

Diagnostic Sample Buttons

The SOUND VOLUME window contains four sound sample buttons...

- Low Tone
- Warning Tone
- High Tone
- Noise Tone

Touch LOW TONE, WARNING TONE or HIGH TONE for a test sound. The LOW TONE, WARNING TONE and HIGH TONE buttons each test one audio frequency band. The system should reproduce all sounds at about the same volume. Listen for volume changes, distortion, missing sounds or intermittent sounds.

Touch NOISE TONE, and the Game outputs noise across all audio bands. Listen for an absence or unusual emphasis of high, low or midrange sound.

Config/Test - Sound Volume (continued)

Master Volume

The double-headed, “MASTER VOLUME” arrow is below the sound sample buttons. Between the arrows is a slider box. Use the arrows and slider to set the game’s non-award sound volume. The slider can be moved through the volume range of zero on the left end to 255 on the right end.

- Touch the arrowheads to change the level in small steps.
- Touch the arrow body beside the slider to change the volume in large steps.
- Drag the slider to smoothly change sound volume.

Sound Call

Touch SOUND CALL to display a numeric keypad. This keypad tests sounds at various EPROM locations by entering addresses. Typical addresses appear in the table Sound Call Test. Depending on which theme is installed, the machine may include sounds at these addresses. Sound calls can be used to check volume settings and audio hardware performance. Touch keypad keys to enter each digit of an address in decimal notation. Touch the arrow to advance to the next digit of the address.

OK will play the selected sound and exit the Sound Call window.

PLAY will play the selected sound and stay in the Sound Call window.

CANCEL will exit the Sound Call window.

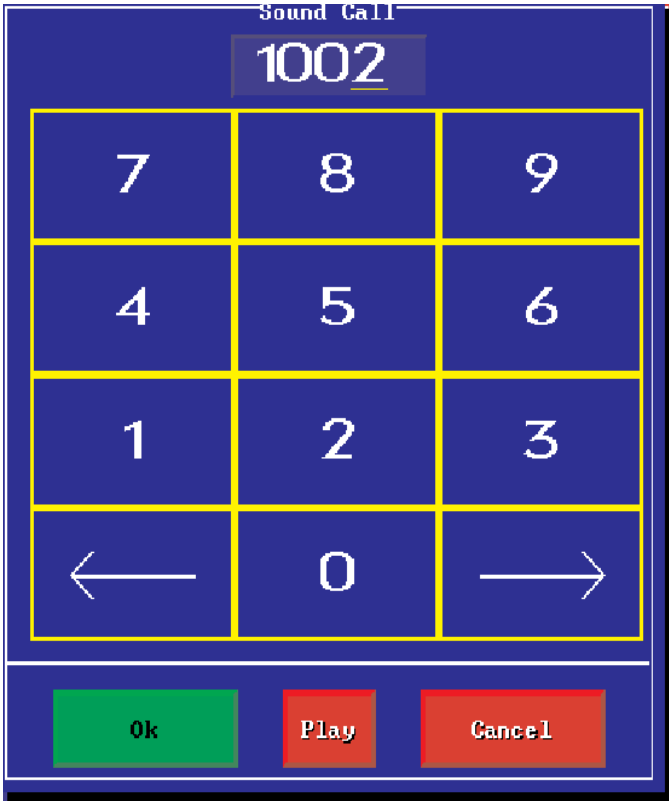
Award Volume

Touching Award Volume adds two sliders to the VOLUME window:

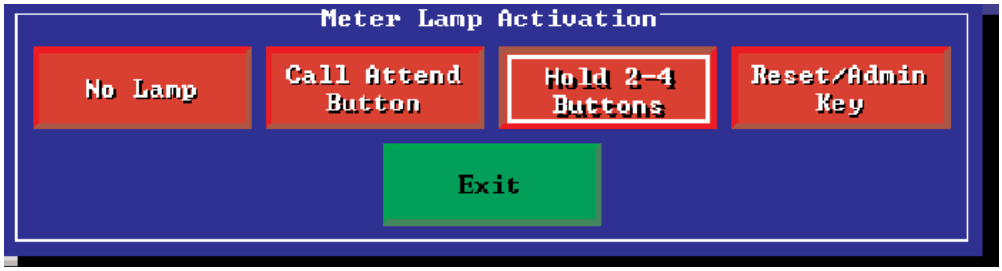
- Large Award Volume
- Top Award Volume

The MASTER VOLUME slide control that we described above continues to function the same way. The other two sliders operate in the same manner as the MASTER VOLUME slider. Use the other two sliders to raise or reduce the sound volume during awards.

Touch EXIT to leave the window.



Config/Test - Meter Lamp Activation



The Meter Lamp Activation window configures the function of the lamp located in front of the meters. Only one of the four options may be chosen.

NO LAMP - the lamp will not light.

CALL ATTEND BUTTON - when the Call Attendant Button, also called the Change button, is depressed the lamp lights until the Reset key or Diagnostic button is activated.

HOLD 2-4 BUTTONS - This controls the lamp manually. the combination of the second and fourth Line buttons will cause the lamp to light.

RESET/ADMIN KEY - The lamp will be on while the Administration mode is on.

Config/Test - Disable Machine

Touch DISABLE MACHINE to disable the game. The Game enters the Out-of-Service Mode. The screen displays an out-of-service banner. To exit, press the white DIAGNOSTIC button.

Before disabling the machine, clear all credits from the meters. If the button is selected with credits on the meters, a notification window pops up stating the fact. Touch OK, pay the credits, then touch the DISABLE MACHINE button.

Config/Test - Protocol Options

The two buttons to choose from in the Protocol Options window are:

CHOOSE PROTOCOL CONFIGURE PROTOCOL

The machine uses this protocol for gaming device-to-host communication. The host must employ the same protocol as the game.

Choose Protocol

This window varies depending on the software installed into the game.

Portion of the Revision window showing the Software Program Number

The Software Program Number will indicate which Choose Protocol window will be displayed. The first letter may be a V (for a video/hopper game) or a P (for a video/printer game). The letter after the first dash indicates the protocol. It may be an X, 3, 4, or 5.

The combination of a V and an X will display the following choices:

NONE ACP SAS PLUS SDS

The combination of a V and a 4 will display the following choices:

NONE SAS4

The combination of a V and a 5 will display the following choices:

NONE SAS5

The combination of a P and a 3 will display the following choices:

NONE SAS3

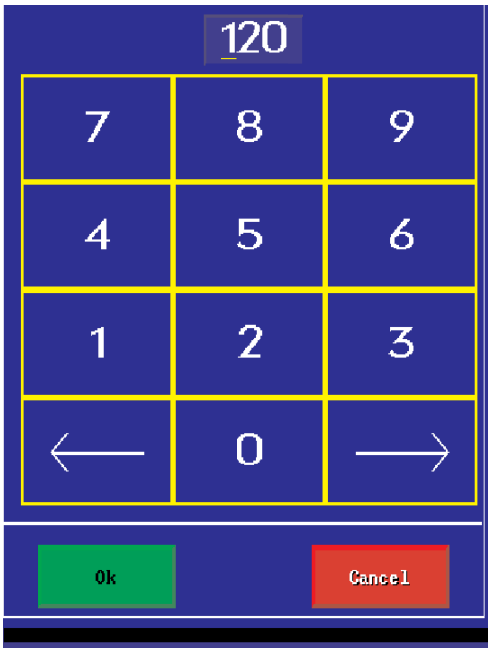
The combination of a P and a 5 will display the following choices:

NONE SAS4 SAS5

To close any of these windows and save your setting, touch EXIT.

Once a selection is made and the window is exited, a RAM Clear is required to change the protocol selection. Returning to the window will display only the previous selection.

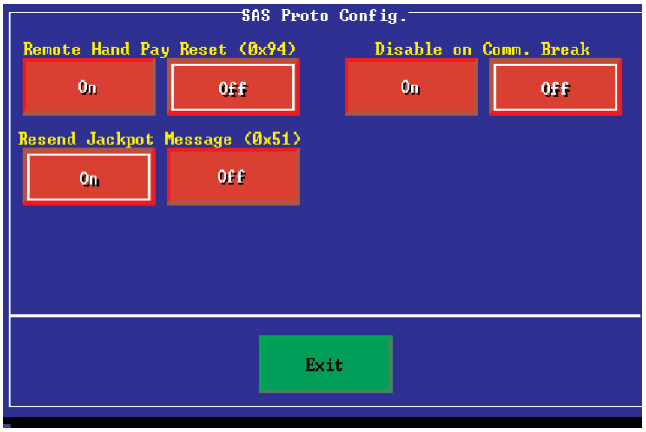
Config/Test - Protocol Options - Configure Protocol



Terminal Address Options Touch the keypad keys to enter each digit of an address in decimal notation. Your machine uses this three-digit, SAS plus address during Game-to-host communication. Touch the arrow to advance to the next digit of the address. Allowable addresses range between zero and 127. To close the window and save your setting, touch OK. To close the window without saving settings touch CANCEL.

SAS Proto Config There are three choices when configuring the SAS protocols: Remote Hand Pay Reset, Resend Jackpot Message, and Disable on Communications Break.

When the Remote Hand Pay Reset function is On, the game requires a verification signal from the host to print a ticket. Setting the Reset function to Off will allow the game to print tickets without host verification.



The Resend Jackpot Message function will send a message every 30 seconds to the host when a Jackpot occurrs until the attendant clears the game. Touching Off will cause the game to send a single message to the host.

Touching the Disable on Communications Break On button will not let the game be played if communication signal is lost, until host communication supervision is restored. Selecting Off will allow the game to be played without host communication.

Touch Exit to save the selected settings and leave this window.

SDS Proto Config When reading a ticket the game will send a message to the host.

If D0, D1 COUPON MSGS ON is selected the values in the message will be in credits.

If D6, D7 TICKET MSGS ON is selected the values in the message will be in cash.

Touch Exit to save the selected settings and leave this window.

Config/Test - Printer Options

Printer Types

The printer must be selected before TICKET OPTIONS can be chosen.

There are 3 choices of printer types: None, Ithaca Model 70 Dot Matrix Printer, and Ithaca Model 750 Thermal Printer. The Ithaca 850 Thermal Printer emulates the 750, and uses the same drivers. If an Ithaca 850 Thermal Printer is installed in the game, select the Ithaca Model 750 Thermal Printer button.

Touch Exit to save the selected settings and leave this window.

Once a selection is made and the window is exited, a RAM Clear is required to change the printer selection. Returning to the window will display only the previous selection.

Paper Options (Only opens a window if a thermal printer was selected.)

Choose the desired paper (short size 120mm or bill size 156mm).

Touch on-screen Exit button to return to Config/Test menu.

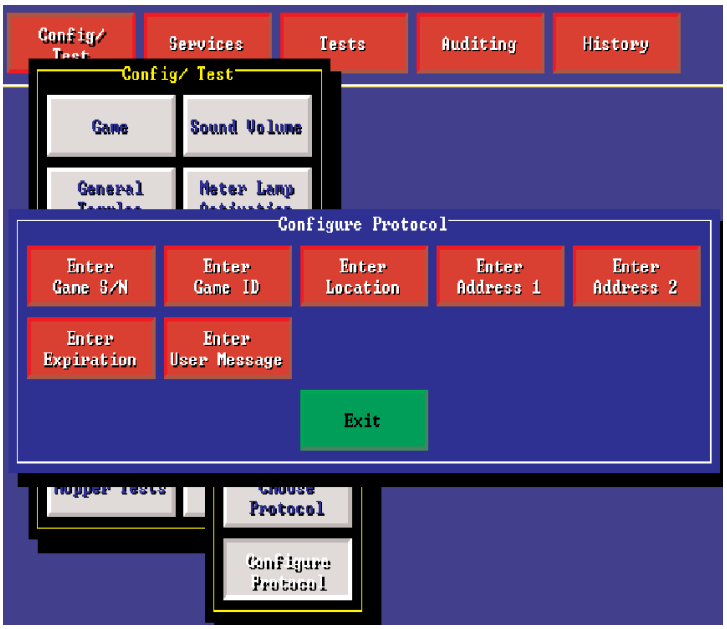
Config/Test - Ticket Options - Choose Protocol

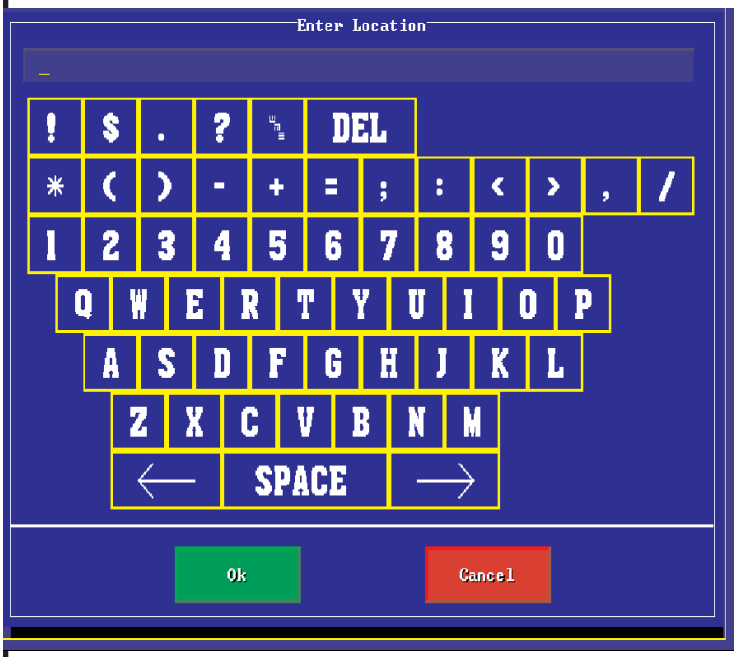
Select one of the two options: None or SAS.

Touch Exit to save the selected settings and leave this window.

Once a selection is made and the window is exited, a RAM Clear is required to change the protocol selection. Returning to the window will display only the previous selection.

Config/Test - Ticket Options - Configure Protocol





The information entered in the Configure Protocol window is printed on the tickets.

Two of the seven buttons bring up a numeric keypad: Game ID, and Expiration. The other five bring up a keyboard window.

Game S/N

This information is obtained from the Serial Number Identification Plate.

Game ID

This is the Host Identification number.

Location, **Address 1** and **Address 2**

These three buttons bring up the Keyboard window, and the information entered are up to the casino.

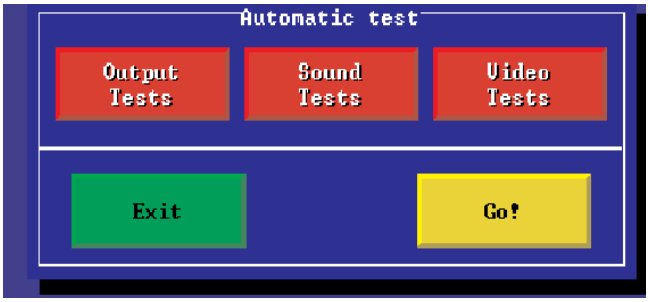
Expiration

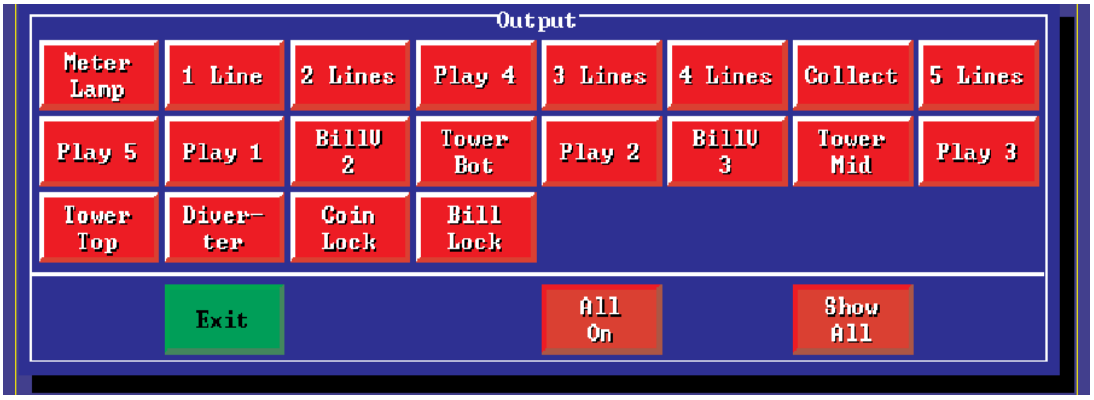
This number is the number of days until the ticket is void, from the print date.

User Message The information entered is up to the casino.

Services - Automatic Tests

Automatic Test Mode enables continuous test of Game hardware. This window has three buttons: Output Tests, Sound Tests, and Video Tests. Select the desired tests. Then touch GO! The Game sequences through the selected tests.

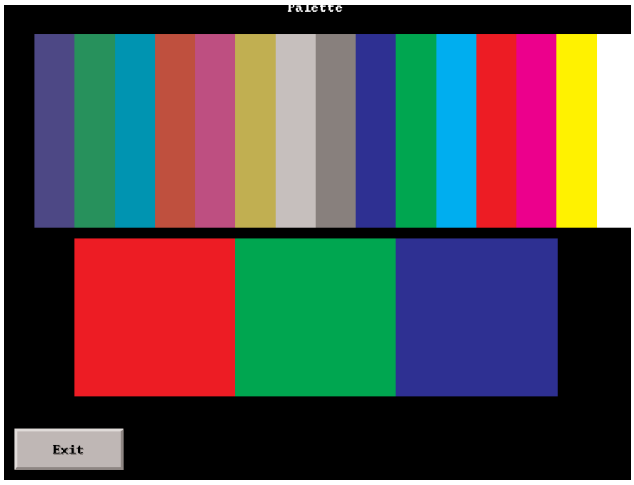




Output Tests: The Game lights lamps and checks switch status.

Sound Tests: The Game produces sample sounds to test audio hardware.

Services - Automatic Tests (continued)



Video Tests

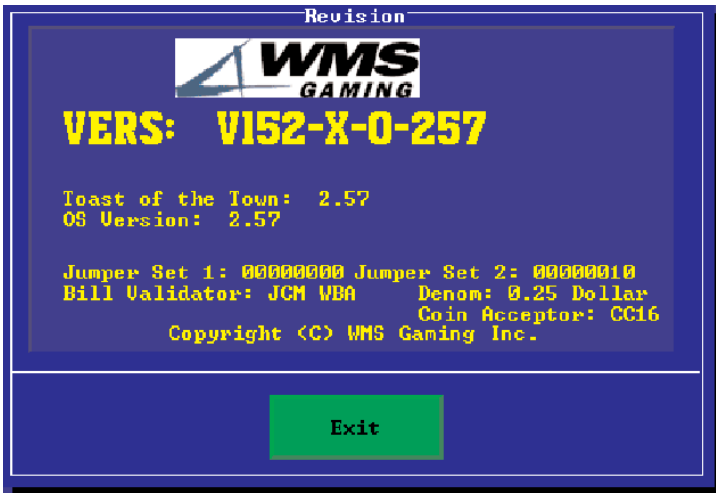
Palette (color bars) helps assess gun adjustment.

Convergence: Crosshatch pattern helps assess alignment, convergence.

Color Purity screens: Red Green Blue White

Touch EXIT to return to the Services Window.

Services - Revision



The Revision screen shows data about the software and game configuration.

Chip derived information

- Version Program Number
- Theme Name and Theme revision
- Operating System Version

Detected information

- Jumper Set 1, are Soldered Jurisdictional
- Jumper Set 2, are bonus jumpers
- Installed Bill Validator

Ram Clear Designated Information

- Denomination
- Coin Acceptor

Touch EXIT to return to the Services Window.

Services - Set Clock

Date

Use the arrows to position the cursor in the date display. Use the onscreen numeric keys to enter the correct date (MMDDYY). Then touch the OK button. The window closes.

Time

Use the arrows to position the cursor in the time display. Use the onscreen numeric keys to enter the time in 24-hour form. Then touch the OK button. The window closes.

Tests - I/O - Currency

Open the Currency window.

Insert a valid coin into the coin slot. The test coin meters should increment the coin count. This window should record the pulse length of the acceptor coin deposit signal in milliseconds.

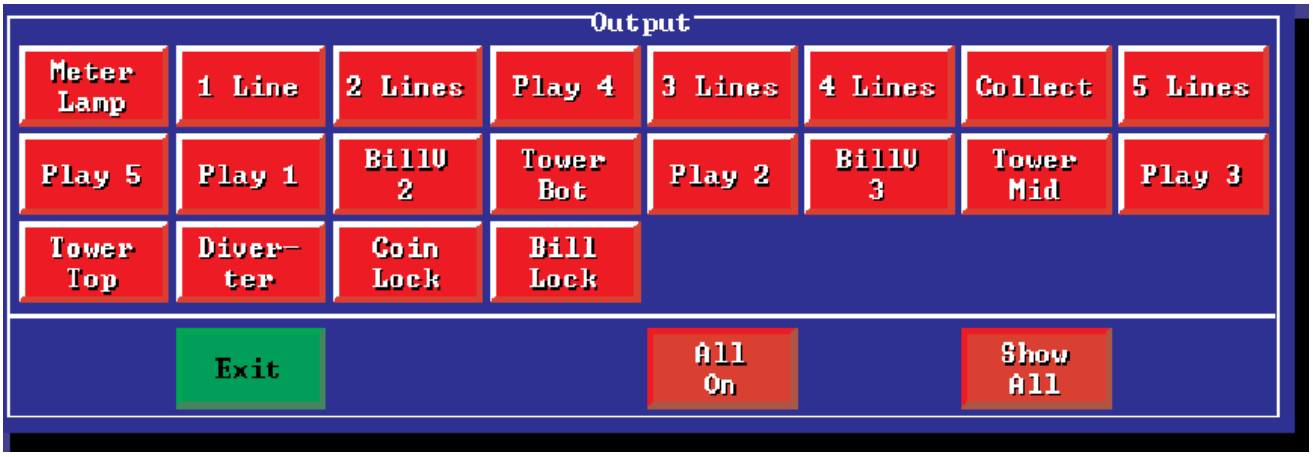
Insert a $1, $5, $10, $20, $50 or $100 bill into the BV slot. The window displays the bill denomination ($10 example circled.)

Tests - I/O - Input

This window lists the Game's input switches, buttons, and opto detectors. Test a switch by closing it. If the input works, the screen highlights the input's name.

Touch EXIT to close the window.

Tests - I/O - Output



Test an output by touching that output's touch screen button. Turn an output on or off by touching its button.

Touch ALL ON to to toggle all switches on. Touch ALL OFF to toggle them off again.

Touch SHOW ALL to view the lamp matrix layout. (In the matrix layout, "R" stands for lamp row, and "C," for lamp column).

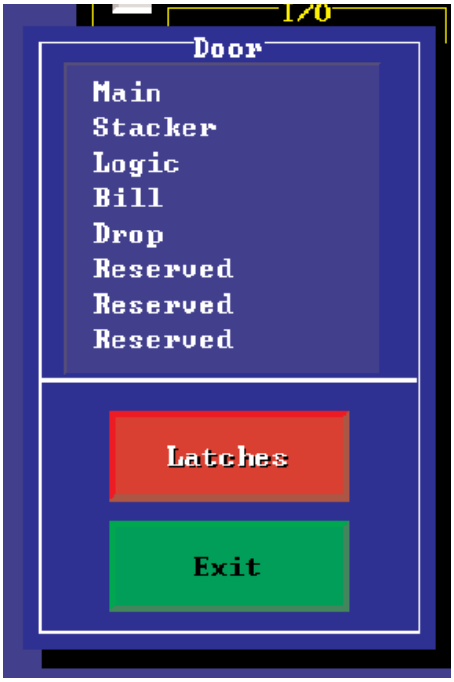
Touch EXIT to close the window.

Tests - I/O - Door

Check door switches by pushing and releasing each switch. As each door opens, the screen highlights the corresponding door name.

Touch LATCHES (on the screen) to maintain an “on” condition across any closed switch.

Touch EXIT to close the window.



Tests - I/O - Video

This window gives assistance with monitor adjustments. (For more on these adjustments, consult the monitor manual.) VIDEO includes these options:

Palette (Color Bars) This screen simplifies color gun adjustments. (See page 16 for sample images.)

Convergence (Crosshatch Pattern) Use this pattern during convergence and raster positioning. The crosshatch pattern also helps during raster height and width adjustments.

Purity Screens

Touch RED, GREEN, BLUE or WHITE to display a solid-color purity screen. Purity screens help during purity magnet adjustments, relative gun output tests, degaussing and rejuvenation. Use the white screen for color temperature testing.

Tests - I/O - Touch Screen

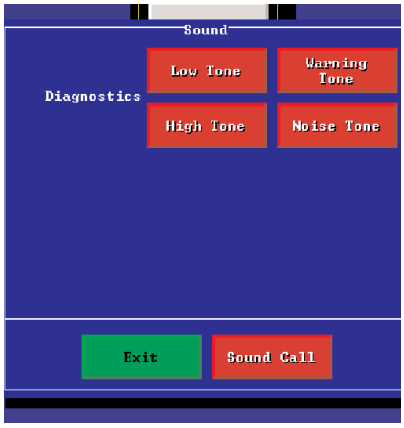
Touch TOUCH SCREEN to adjust or verify screen calibration. TOUCH SCREEN opens a window with two buttons: TOUCH CAL and TOUCH TEST.

If the calibration is so poor that the Touch Screen Test can't be activated from the screen, press and hold the CHANGE button. Simultaneously turn the ADMINISTRATOR KEY switch. The Game automatically enters the TOUCH CAL option.

Touch Calibration matches cursor position to touch position. Touch the number 1 in the window's bottom left corner. A new window replaces the first. Touch the number 2 in the window's top right corner. The screen calibrates to your touch. Then the Tests Menu returns.

Touch Test reveals how well the cursor tracks finger movement. Touch several screen locations. Notice the "Down" and "Lift" coordinates in the window's bottom left corner. These report where your finger touched and rose off the screen. The "Drag" coordinates define where your finger currently rests on the screen.

Tests - I/O - Sound



This window tests the sound hardware.

Diagnostics There are four sound sample buttons:

- Low Tone
- Warning Tone
- High Tone
- Noise Tone

The LOW TONE, WARNING TONE and HIGH TONE buttons each test one audio frequency band. The system should reproduce all sounds at about the same volume. Listen for volume changes, distortion, missing sounds or intermittent sounds.

The NOISE TONE outputs noise across all audio bands. Listen for an absence or unusual emphasis of high, low or midrange sound.

Sound Call displays a numeric keypad. This tests sounds at various EPROM locations by entering addresses. Typical addresses appear in the table Sound Call Test. Depending on which theme is installed, the machine may include sounds at these addresses. Sound calls can be used to check volume settings and audio hardware performance. Touch keypad keys to enter each digit of an address in decimal notation. Touch the arrow to advance to the next digit of the address.

OK will play the selected sound and exit the Sound Call window.

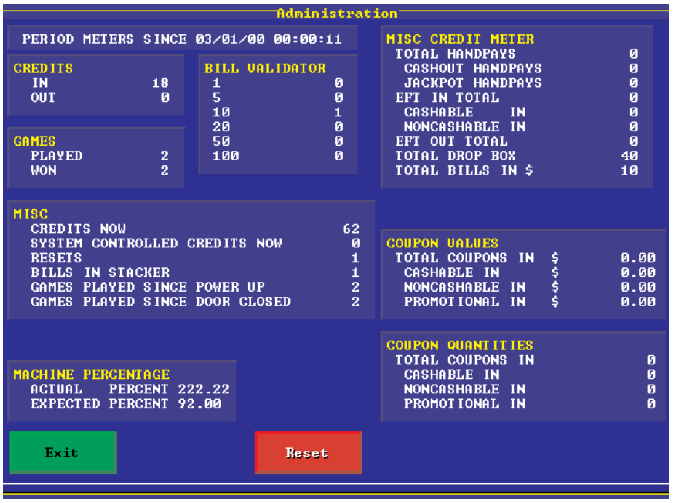
PLAY will play the selected sound and stay in the Sound Call window.

CANCEL will exit the Sound Call window.

Auditing

The Auditing screens show information allowing the attendants to verify game actions and meters. There are three levels of meters: Mechanical meters which are never reset, Master meters which are reset during RAM Clears, and Period meters which can be reset by the reset button on the Period Main Meters window. The Master and Period window's formats are identical except for Reset button and the name in the title box, though the data will be different if the Reset button was touched since the last RAM Clear.

Auditing-Main Meters



Credits

In: Credits played.

Out: Credits won/played from winnings (not including jackpots).

Bill Validator

of bills of each listed denomination that has been accepted.

Misc. Credit Meter

Total Handpays: Cashout and Jackpot handpay credits.

Cashout Handpays: Handpays from credits accumulated over the hopper limit and cashed out by the player or force by the hopper limit.

Jackpot Handpays: Handpays from a single win greater than the Jackpot limit.

EFT In Total: Electronic funds transferred in (credits).

Cashable In: EFT that can be paid out.

Noncashable In: EFT in that must be played not paid.

EFT Out Total: Electronic funds transferred out.

Total Drop Box: Coins passed into the drop box. (NOTE: May depend on the jurisdictional requirements.)

Total Bills In $: Value of bills accepted.

Games

Played: Number of games played.

Won: Number of games won.

Misc.

Credits Now: Credits currently on meter.

System Controlled credits Now: Progressive system credits

Resets: Power ups since last RAM Clear.

Bills in Stacker.

Game Played Since Power Up.

Games Played Since Door Closed.

Machine Percentage

Actual Percent: The % of actual payout.

Expected Percent: expected % of payout. Displays the weighted average of games played at each %, when % has been changed.

Coupon Values and Quantities

Cashable credits may be played or paid.

Non-cashable credits can only be played not cashed out.

Promotional credits are non-cashable credits that cannot be transferred to another machine.

Auditing - Host Bonus Meters

Host Bonus Meters are only available with SAS4 or SAS5 software.

Initiated Total: # of credits won due to bonus awards initiated by host.

Deductible - Credits which are considered part of game play and deductible for tax purposes.

Non-Deductible - Credits which are considered promotional and are not deductible by the casino for tax purposes.

Wager Match - Credits won due to wager match bonus awards. Treated as “won” credits and used to calculate true hold percentage.

Multiplied Total - Total credits won due to jackpot multipliers

Deductible - Credits which are considered part of game play and deductible for tax purposes.

Non-Deductible - Credits which are considered promotional and are not deductible by the casino for tax purposes.

Auditing - Theme Win Meters

Credits
Played: Total amount of credits played.
Won: Total amount of credits won.

Games
Played: Total number of games played.
Won: Total number of games won.

Game Hold
Percent: The % of actual wins.

Bonus: There may be more than one bonus type.
Bonus Awards: # of times bonus round happened.
Bonus Won: Credits won in all bonus rounds combined.

Stops: Theme specific reel combination hits. The rest of this list is accessible via the MORE METERS button.

If more than one percentage setting has been used, the PERCENT button will display the corresponding data in each of the preceding fields.

Auditing - Coin Meters

Physical Coin In: Sum of all normal, escrow, test, and error coins put into machine.

Normal Coin In: Total amount of coins credited to credit meter.

Escrow Coin In: Total amount of coins accepted but not credited to credit meter.

Test Coin In: Total amount of coins accepted in the administrative screen currency test or I/O tests.

Error Coin In: Total amount of long coins accepted but not credited to credit meter.

Physical Coin Out: Sum of all hopper, escrow, test, service, and extra coins released from machine.

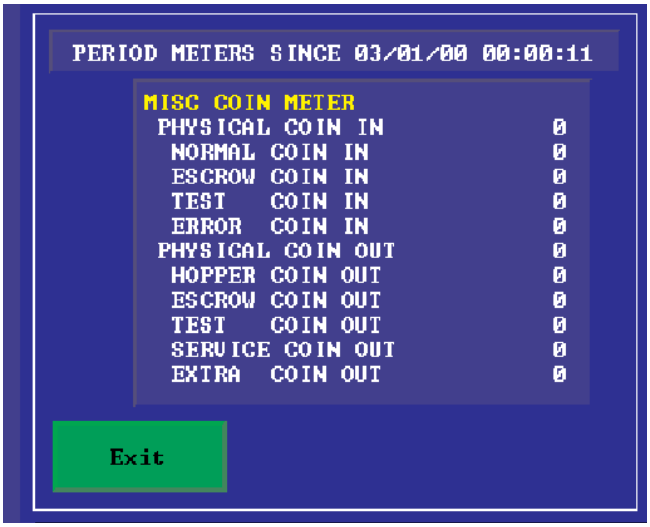
Hopper Coin Out: Total amount of coins paid out from hopper and deducted from credit meter.

Escrow Coin Out: Total amount of escrow coins in returned.

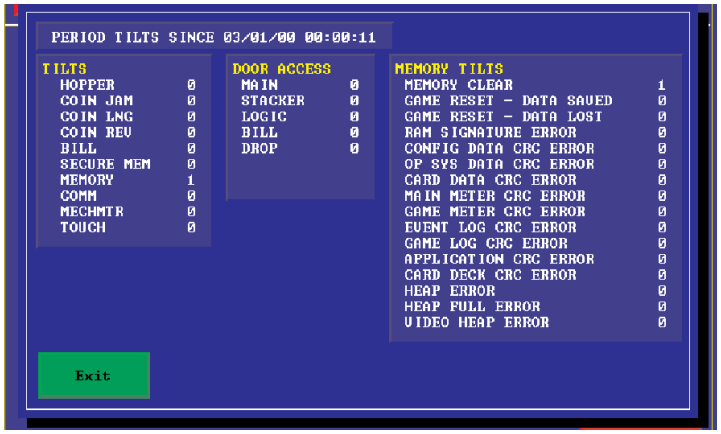
Test Coin Out: Total amount of test coins paid out from hopper test but not deducted from credit meter.

Service Coin Out: Total amount of replacement coins paid out from hopper but not deducted to credit meter.

Extra Coin Out: Total amount of coins dispensed from hopper unintentionally but not deducted from credit meter.



Auditing - Tilts



F.Y.I. CRC = Cyclic Redundancy Check. It is an improved “Checksum.”

Tilts

Hopper: Number of hopper tilts.
Coin Jam: Number of jammed coin tilts.
Coin Lng: # long coin tilts (coins taking too long to pass through the coin mech).
Coin Rev: # of reversed coin tilts (coins setting off the last coin mech trigger first).
Bill: Number of bill tilts.
Secure Memory: Number of security tilts.
Memory: # of memory corruption tilts.
Comm: Number of protocol tilts.
Mechmtr: # of mechanical (hard) meter tilts.
Touch: Number of touch screen tilts.
Dot Board: Number of dot board tilts.

Door Access

Main: Number of times Main door has been opened since last RAM Clear.
Stacker: Number of times Stacker door has been opened since last RAM Clear.
Logic: Number of times Logic door has been opened since last RAM Clear.
Bill: Number of times Bill door has been opened since last RAM Clear.

Memory Tilts - # of occurances of each of the following since last Hard RAM Clear

Memory Clear: Successful RAM clear.
Game Reset - Data Saved: Successful Reset, meters, history and event log data are saved.
Game Reset - Data Lost: Successful Reset, meters, history and event log data are lost.
RAM Signature Error: RAM Clear data (denomination, coin timings, RAM clear version, etc.) is corrupted.
Config Data CRC Error: Configuration data CRC corrupted.
Op Sys Data CRC Error: Operating system data CRC corrupted.
Card Data CRC Error: Obsolete
Main Meter CRC Error: Main meter CRC corrupted.
Game Meter CRC Error: Game meter CRC corrupted.
Event Log CRC Error: Event log CRC corrupted.
Game Log CRC Error: Game log CRC corrupted.
Application CRC Error: Application CRC corrupted.
Card Deck CRC Error: Obsolete.
Heap Error: Heap corrupted.
Heap Full Error: Heap full.
Video Heap Error: Video heap full.

History - Play History

This window logs final game play screens from previous games. Use the log to verify winnings. The screen shots are displayed in reverse order with the most recently played game first.

The log tracks, at least, the past ten bets.

Touch the PREV GAME button to scroll back to the desired play history.

Touch the NEXT GAME button to scroll forward to the desired play history.

If the game has a theme with a bonus round, there will be a BONUS button to advance to the details of the bonus screen.

If a Dot Matrix Printer is installed in a lottery jurisdiction, a PRINT button is displayed to get a hard copy of the data.

Touch the EXIT button to close the window.

History - Logs

The History Logs are very similar in layout with different types of content. They all provide time and date, and in the lower area two numbers indicating # of items, and # of pages starting with 0.

To scroll the screen data, touch the LATER or EARLIER button. Printer Games: Touch PRINT for a hard copy of Log data.

TERM. EVENTS are reports of any situation that raises an error flag. Here are some events that raise error flags:

- Bill Recall
- Cash Out
- Corrupt Memory
- Door Access
- Power On Reset
- Touch Screen Malfunction

The BILL LOG listing shows Bill Validator events by type, such as “Bill Stacked”, and the denomination of bills.

COUPON LOG listing shows the type of event, such as “Cashable Coupon” and Value. This is available with SDS or SAS5.

The EFT LOG listing shows the EFT (Electronic Funds Transfer) from the host event transactions and lists value, and type.

The TICKET LOG listing shows the Event, Voucher# and Amount. It is only available with SAS5.

The HOST BONUS LOG listing shows the credits won due to bonus awards and jackpot multipliers.

Service Coin

The Service Coin Button is only found on the full administrators menu in the lower right corner.

Touching the screen button will open a menu with two choices: Release 1 Coin, and Exit.

Touching Release 1 Coin will cause the hopper to eject one coin or token.

Exit will return to the main Administration Menu System screen.

Chapter 1. Periodic Maintenance

Collection and Supply

Regular Gaming Device *(GD)* collection and supply procedures include...

- Collecting bills from the Bill Validator *(BV)*
- Collecting coins from the cashbox
- Filling the hopper
- Reading electromechanical meters

NOTICE

Follow your jurisdiction's procedures for logging currency collection.

- **Collecting Bills from the Bill Validator**
  - ❑ 1. Unlock and open the belly door. Notice the BV door at the lower right. Open the BV lock with your key.
  - ❑ 2. Open the BV door.
  - ❑ 3. Use the stacker box release lever *(upper right)* to free the stacker box and then pull the box out of acceptor by its handle.
  - ❑ 4. Unlock stacker box with key and remove bills.

  Reassembly
  - ❑ 1. Slide an empty, locked stacker box into the BV. Take care not to install the box upside-down. The empty box's bill access must face upward.
  - ❑ 2. Tug on stacker box handle to see that it is fully seated.
  - ❑ 3. Close and lock BV door.
  - ❑ 4. Close and lock belly door.

NOTICE

Make a permanent record of the number value on the original meter. Refer to your jurisdiction's rules for recording meter readings.

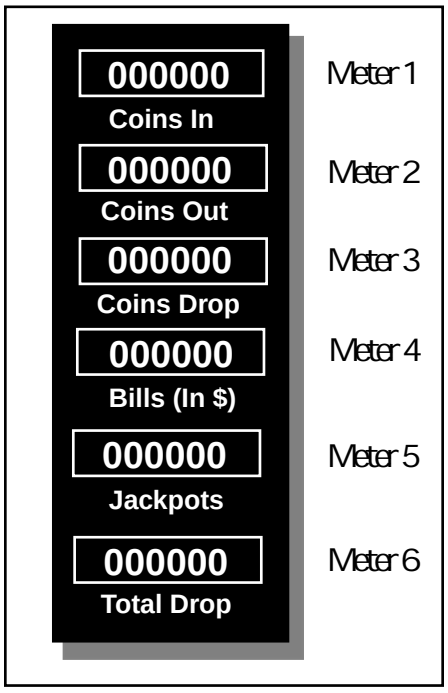
- **Collecting Coins**
  - ❑ 1. Open the pedestal door with your key.
  - ❑ 2. Slide out the cashbox.
  - ❑ 3. Empty the cashbox.
  - ❑ 4. Replace the cashbox.
  - ❑ 5. Lock the pedestal door.

- **Filling the Hopper**
  - ❑ 1. Unlock and open the Main Door.
  - ❑ 2. As necessary, add coins to the hopper. Be careful not to spill coins into the GD cabinet.
  - ❑ 3. Close and lock the Main Door.

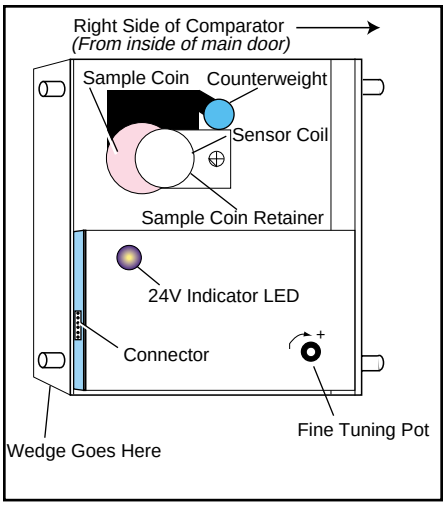
- **Reading Electromechanical Meters**

  The GD includes up to six non-resettable, electromechanical meters. (The number of meters and meter labels may differ between jurisdictions.) The illustration depicts the meters and provides typical labels. You'll find the electromechanical meters to the right of the monitor. You can read these meters from outside the machine, through an access window to the right of the monitor screen. Follow procedures and regulations set up by your jurisdiction.

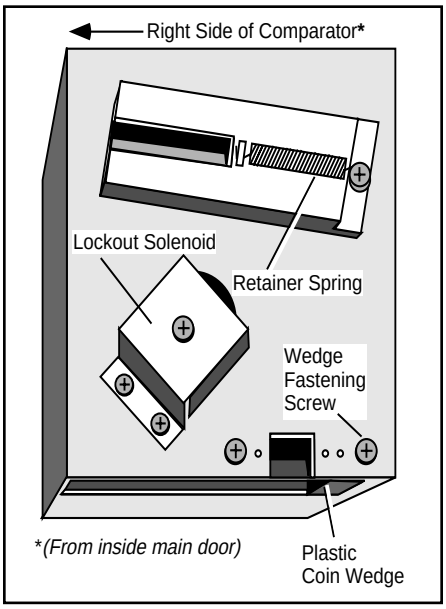
  Electronic (soft) meters are different than electromechanical meters.



Electromechanical (Hard) Meters, as viewed from front of machine (Meter names may vary. Meters 3 and/or 6 are not always used.)



CC-16 Coin Comparator (Front)



Coin Comparator (Back)

Special game software creates and maintains electronic meters. For information on electronic meters, see Model 55X Book 1, Chapter 3, *Auditing, Diagnostic and Adjustment Software.*

Coin Comparator

The CC-16D-INHIBIT coin comparator electronically compares the incoming coin to a sample coin retained by the comparator. The incoming coin passes through a magnetic field, creating a characteristic signal. The sample coin also produces a characteristic signal.

The comparator electronically contrasts the incoming coin signal with the sample coin signal. If the two signals differ, the internal lockout solenoid remains inactive. The incoming coin diverts to the "reject" track. Like signals energize the lockout solenoid. The solenoid allows the incoming coin to enter the "accept" track.

- **Installing the Sample Coin**
  - ❑ 1. Unlock and open the Front Door.
  - ❑ 2. Turn off the GD at the Power Distribution Unit (PDU) behind BV.
  - ❑ 3. Without removing the coin comparator, slide the sample coin retainer toward the right side of the comparator with your thumb *(looking at inside of door)*. The illustration shows where to place the sample coin.
  - ❑ 4. Slip a circulated coin of the proper denomination into the sample coin retainer. Gently release the retainer. The sample coin retainer should tightly secure the sample coin. *(Make sure the coin is straight up and down and positioned properly in the retainer.)*
  - ❑ 5. Turn on the GD at the PDU.
  - ❑ 6. Close and lock the Front Door.

Coin Comparator Specs for CC-16D

Pin	Function	Notes
1	Lockout Enable	
2	"Coin In" Output Signal	
3	Not Connected	
4	Not Connected	
5	+12 VDC	1
6	Ground	
Coin Diameter Range	0.705-1.575” (17.9-40mm)	2
Max. Coin Thickness	0.100” (2.54 mm)	

NOTES
1. Comparator requires regulated power supply for 12VDC operation. Current: Idle, 40 mA; peak, 140 mA.
2. For coin diameters of 1.205 through 1.575” (22.61 through 40mm), use plug spacer.
3. Oversize protection beyond 0.040” (1.02mm) for sample coin requires coin entry slot control.

- **Checking Comparator Performance**
  - ❑ 1. Insert the correct coin in the coin slot *(See "Installing the Sample Coin.")*. The coin comparator should accept the coin. Be sure that the unit functions consistently! Repeat this step several times.*(You may also want to run the Coin Mech Test. See Chapter 3, Book 1.)*

- **Adjusting the Comparator Potentiometer**
  The factory adjusts coin comparators for excellent discrimination against slugs. However, some units may still accept high quality slugs. To enable a unit to reject these slugs, you have to fine tune the comparator...
  - ❑ 1. Unlock and open the Front Door.
  - ❑ 2. Turn on the GD at the PDU (*behind BV).*
  - ❑ 3. Adjust the fine tuning potentiometer *(on front of coin comparator)* counterclockwise by 1/8 turn. Use a #2 flatblade screwdriver.
  - ❑ 4. Close the Front Door.
  - ❑ 5. Insert a high quality slug in the coin slot. The coin comparator should reject the slug. *If not, repeat steps 3, 4 and 5.*
  - ❑ 6. Insert a coin of the correct denomination. If the coin comparator rejects the valid coin, advance the fine tuning potentiometer: Turn pot slightly clockwise. Try the coin again. Repeat this step until the coin passes. *Repeat steps 3 through 6, as necessary.*

Coin Comparator Table

Coin or Token	Dia Range	Weight Range (G)	Thickness Range	Comparator Part Number
•US 5¢ •US 25¢	0.705-1.250	4.4-6.8	0.05 - 0.086	09-42000-1
•US 50¢ •Can $1-E •Can $2-E •SA $1R	0.705-1.250	6.9-19.6	0.05 - 0.086	09-42000-3
•US $1	1.250-1.575	19.7 +	0.075 - 0.115	09-42000-2

Canadian-E = Commemorative or Loonie Coins

- **Removing the Coin Comparator**
  - ❑ 1. Unlock and open the Front Door.
  - ❑ 2. Turn off the GD at the PDU (*behind BV).*
  - ❑ 3. Remove the cable that connects the comparator and Hex Opto Board: Grasp the plug and pull it off the jack.
  - ❑ 4. Remove the coin comparator: Raise the coin comparator slightly. Pull the bottom out of bracket. Then pull the coin comparator down and out of the machine. Set it aside for reassembly.

Reassembly

- ❑ 1. Mount the comparator: Slide the top comparator studs upward, against the bracket. Engage the top comparator studs with the top bracket notches. Pivot and lower the comparator base until the comparator engages the lower notch(s). Check to see that the comparator seats properly.
- ❑ 2. Replace the cable that connects the comparator and Hex Opto Board.
- ❑ 3. Turn on GD power at the PDU.
- ❑ 4. Close and lock the Front Door.

- **Changing the Coin Comparator Denomination**
  - ❑ 1. With your thumb, slide the coin retainer toward the right side of the comparator and remove the sample coin.
  - ❑ 2. Look at the front of the comparator. Above the sample coin retainer, you'll find a thumbscrew. This thumbscrew is the coin counterweight. Unscrew and remove it. Save the counterweight for other conversions.
  - ❑ 3. Turn the coin comparator upside down. Look at the coin exit, near the white cable connector. At the corner of this exit is a #4 Phillips screw. This screw is the wedge fastener screw and fastens the plastic coin wedge in place. Remove the screw.
  - ❑ 4. Use a small, flatblade screwdriver to remove the plastic wedge from the coin exit. Save the wedge for other conversions.

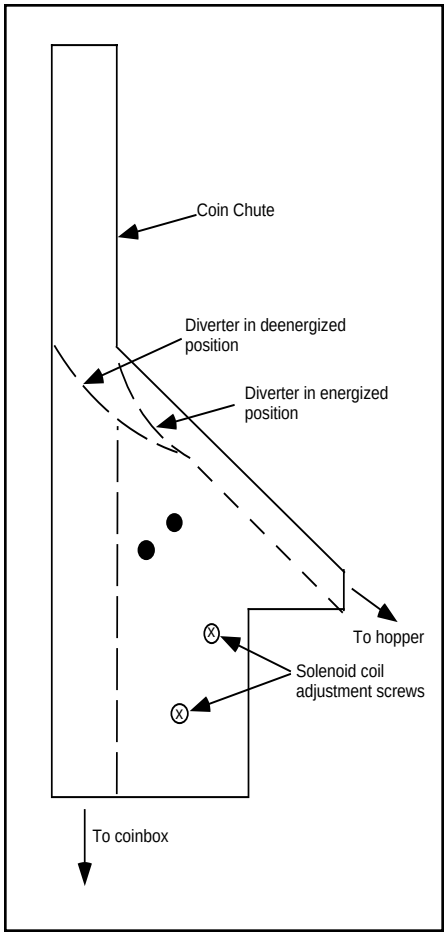
Wedge and Weight Table

Part	Game Denom	Part Number
Wedge	5¢/25¢	03-9140
Weight	5¢/25¢	20-10032-01
	$1	20-10032-02

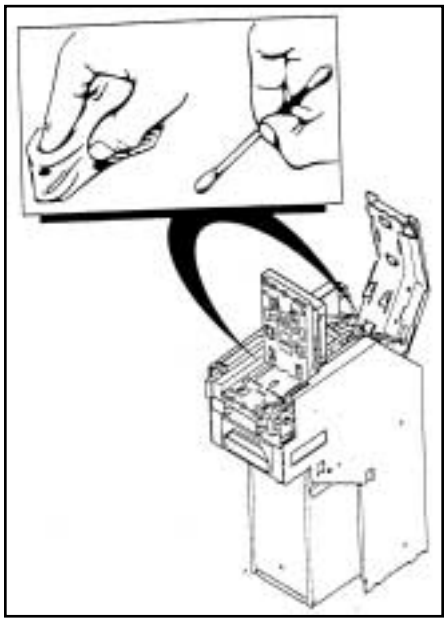
Reassembly

- ❑ 1. Be sure that you have the proper coin wedge for your denomination. (See the *Wedge and Weight Table* in this procedure.) Turn the coin comparator upside down. Look at the back of the comparator *(side with the spring)*. Position the wedge in the side of the coin chute nearest the cable connector. Before you slide in the wedge, locate its mounting screw hole. You'll find the hole at the connector edge of the comparator's spring face. Slide the new plastic wedge into place.
- ❑ 2. Insert a #4 Phillips screw into the mounting screw hole. Fasten the plastic coin wedge in place by tightening the screw.
- ❑ 3. Look at the front of the comparator. Above the sample coin retainer, you'll find a thumbscrew socket. Insert the coin counterweight thumbscrew and screw it in.
- ❑ 4. Slip a circulated coin of the proper denomination into the sample coin retainer. Gently release the retainer. The sample coin retainer should tightly secure the sample coin. Now you can use the comparator in a GD programmed for the comparator's new denomination. Changing the denomination of a GD requires additional steps. You must...
  - Change the comparator denomination
  - Change GD's denomination decals
  - Change the topbox glass
  - Clear the RAM with a RAM Clear Chip for the new denomination: See Changing the VGD Denomination in Chapter 2.

- **Coin Diverter Adjustment**
  - ❑ 1. Unlock and open the Front Door.
  - ❑ 2. Turn off the GD at the PDU On/Off switch (*behind BV).*
  - ❑ 3. Remove the cable that connects the comparator and Hex Opto Board: Grasp the plug and pull it off the jack.
  - ❑ 4. Remove the coin comparator: Raise the coin comparator slightly. Pull the bottom out of bracket. Then pull the coin comparator down and out of the machine. Set it aside for reassembly.
  - ❑ 5. The diverter is a two-position, solenoid-driven metal coin guide surface. When the diverter solenoid rests, the diverter guides coins into the hopper. When the diverter solenoid energizes, the diverter permits coins to fall into the coinbox. Look down into the coin chute and visually check the diverter. With a finger, move the diverter flapper and solenoid plunger and verify that they travel freely.
  - ❑ 6. Perform Diverter Test. *(See Chapter 3, Book 1, Tests Menu/Output/Diverter button.)*
  - ❑ 7. Check that when the touch screen diverter button is pressed, the diverter solenoid energizes causing the flapper to move to the upright position, allowing the coins to drop into the coinbox.
  - ❑ 8. If this does not occur, you must loosen the two solenoid adjustment Phillips screws on the side of the coin chute.
  - ❑ 9. Move the solenoid/plunger so that the diverter is in this energized position.
  - ❑ 10. Tighten the Phillips screws.
  - ❑ 11. Repeat steps 6 and 7.
  - ❑ 12. At its travel extremes, the diverter must stop beyond the coin chute's outside edges. Misadjustment causes difficult-to-diagnose coin jams. With coin comparator removed, shine a penlight down the coin entry and into the coin chute. Again, using the Diverter Test, energize the solenoid. When energized or at rest, the diverter must clear the edges of the coin chute. Watch as the solenoid energizes: You should see the diverter disappear beyond one edge of the coin chute. As the diverter solenoid rests, the diverter should disappear beyond the coin chute's other edge. If the diverter doesn't disappear at either travel extreme, then you must adjust it further.
  - ❑ 13. Close the Main Door.
  - ❑ 14. Test diverter by placing several coins into the coin entry and then check to see that they fall into the coinbox. Also check to see that when the solenoid is deenergized, input coins fall into the hopper. Adjust solenoid position as necessary.
  - ❑ 15. When you're satisfied with diverter performance and adjustment screws are tightened, replace the coin mechanism and reconnect cable to Hex Opto Board.
  - ❑ 16. Switch on GD power at the PDU.
  - ❑ 17. Close and lock the Main Door.
  - ❑ 18. Run several coins through the chute and confirm proper diverter operation.



Coin Diverter Adjustment



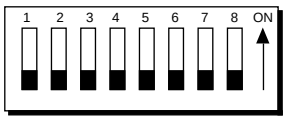
Cleaning the Reader

CAUTION

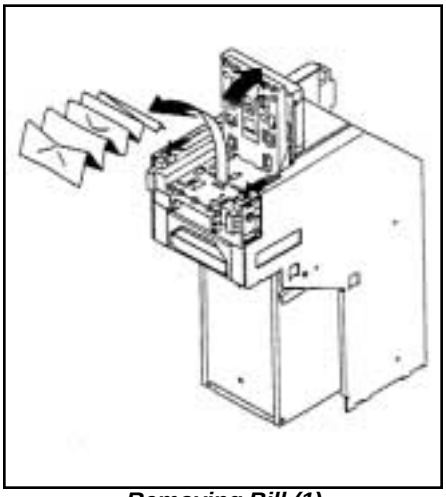
- *Never* use an organic solvent such as thinner to clean the bill validator unit!.
- *Never* use compressed air to clean the bill validator unit!

CAUTION

JCM Bill Validator DIP Switch Settings. Your JCM bill validator has one DIP switch bank that has eight switches. The factory setting for these DIP switches is *all switches off. Don't change these settings!* Changes can cause the bill validator to malfunction.



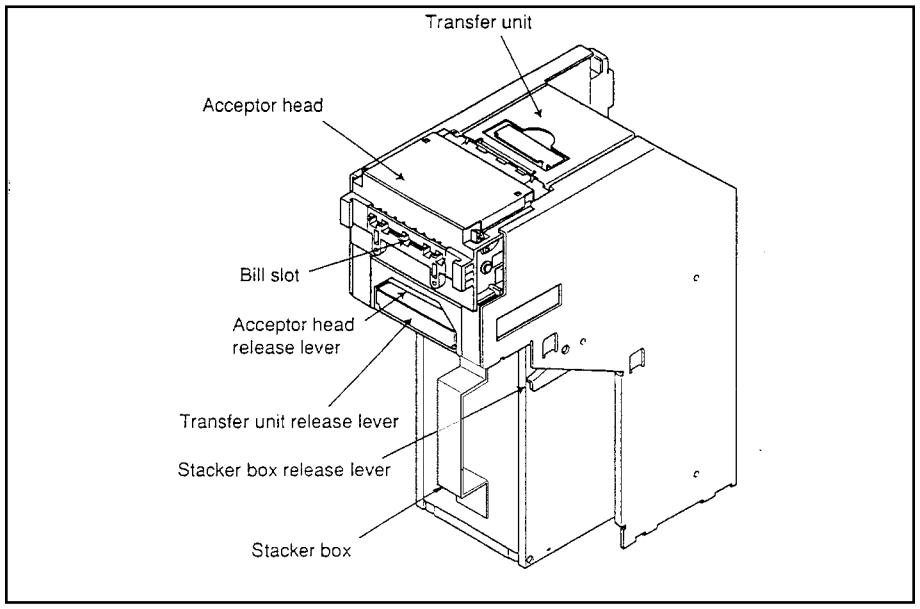
JCM Bill Validator DIP Switch Settings



Removing Bill (1)

WARNING

Switch off GD power at the PDU before working on WBA, glass and lamps. Otherwise, you risk potentially lethal shocks, serious burns and equipment damage.



JCM WBA Bill Validator

Bill Validator

With proper handling and routine preventive maintenance, you can eliminate most bill validator malfunctions. The following procedures assure top performance from your JCM World Bill Acceptor® (WBA) Bill Validator (BV).

- **Bill Validator LEDs**
  Lit LEDs indicate that the bill validator is normal. If the LEDs go out, the GD has probably shut down the bill validator. (Otherwise, all LEDs have burned out. This situation is quite unlikely.) Routinely check the LEDs to see if they remain lit. If not, then *service the validator.*

- **Cleaning**
  MAG SENSOR PARTS. Regular cleaning is imperative. Sometimes iron filings adhere to the magnetic head and head roller. Filings can prevent your bill validator from receiving bills.

  LENSES. To function properly, the BV must have clean sensor lenses and optical reflectors. Periodically cleaning of the BV interior can prevent bill jams. If your validator takes in fewer than 4,000 bills a week, clean it *once a month.*

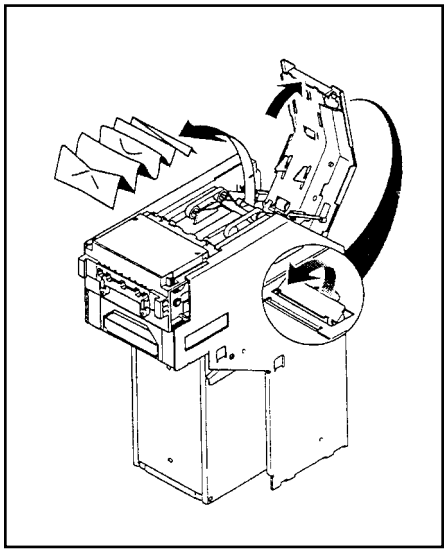
  What if the validator takes in over 4,000 bills per week? Clean the unit *twice a month.*

- **Cleaning Procedure**
  - ❑ 1. Pull the release levers on both sides of the BV toward you to open the acceptor head.
  - ❑ 2. Open the head.
  - ❑ 3. Pull the transfer unit release lever to open the top cover.
  - ❑ 4. Open the top cover.
  - ❑ 5. The reader and its internal sensor may be dirty. A dirty reader can cause jams or reduce bill validation accuracy. Regularly

clean the inside of the validator. Use a soft, lint-free cloth or swab to clean sensor lenses. Soak the cloth or swab with ordinary head cleaner or isopropyl alcohol. *Do not use an organic solvent such as thinner.* Clean oil smudges and fingerprints off the optical reflector disc.

- **Simple Repairs**
  OBSERVE OPERATION. To determine the cause of malfunctions and detect defective parts, routinely observe validator operation. Before replacing parts, check the connectors: Do they engage properly? If the harness appears worn or damaged, replace it.

- **If the Validator Jams...**
  Follow the steps at *Cleaning Procedure* to open the BV. Remove the jammed bill. (Refer to the three *Removing Bill* drawings.) When a bill is jammed near the inlet of the stacker box, pull the release lever of the stacker box, remove stacker box by its handle and remove the jammed bill. Remember, when replacing the stacker box, the notch on the handle goes up.



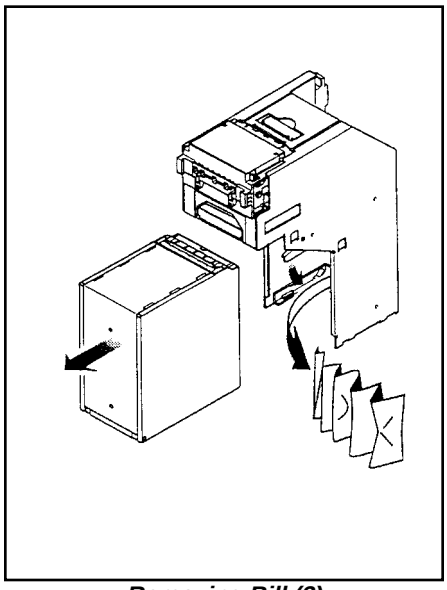
Removing Bill (2)

Glass and Lamps

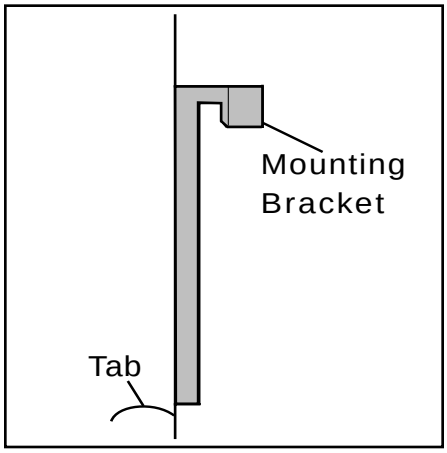
- **Removing Buttons and Replacing Bulbs**
  - ❑ 1. Unlock and open the Main Door.
  - ❑ 2. Switch off GD power at the PDU.
  - ❑ 3. You can easily access a button switch from under the Player Panel inside the door.
  - ❑ 4. Grasp the lamp bracket just behind the plastic nut. Firmly rock the lamp bracket back and forth until it disengages from the button housing. Then pull the lamp bracket away from the button housing. *(Take care not to bend switch leads.)*
  - ❑ 5. If you want to remove the button housing, start by unscrewing the notched, plastic nut.
  - ❑ 6. If you're removing the button housing, the nut support will also come off. Lift the button housing off the Player Panel.
  - ❑ 7. Grasp and pull the old bulb straight out.

  Reassembly
  - ❑ 1. Replace the bulb. Use a type CM86 or equivalent bulb (WMS part 24-8829).
  - ❑ 2. If you removed the button housing, replace it through the button hole. Make sure that the letters read right-side up. Replace the nut support from the button housing.
  - ❑ 3. If you removed the button housing, secure it with the plastic nut. (The serrated edge of the plastic nut should face the player panel.)
  - ❑ 4. Hold down the button and snap the lamp bracket back on. Test the button to be sure that the bracket seats properly.
  - ❑ 5. Switch on GD power.
  - ❑ 6. Close and lock the Main Door.

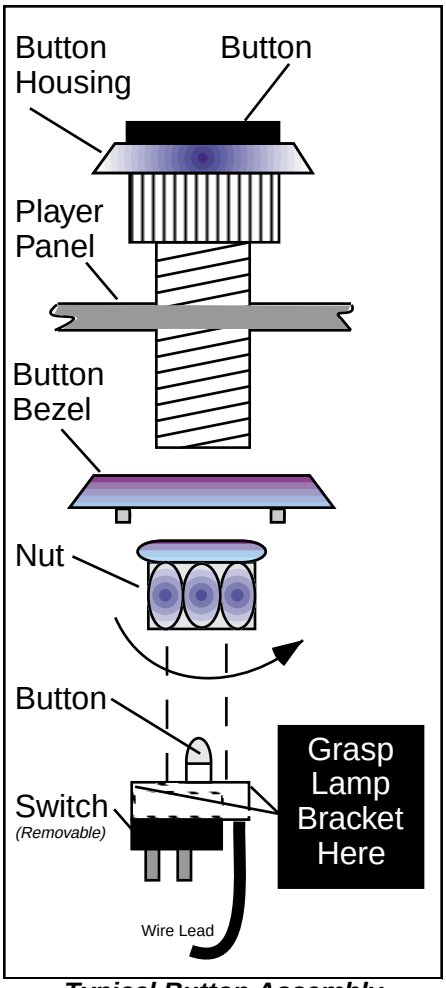
- **Removing the Topbox Glass**
  - ❑ 1. Unlock and open the Main Door.



Removing Bill (3)



Card Reader Face Plate (Rt. Side)



Typical Button Assembly

❑ 2. Switch off GD power at the PDU.
❑ 3. Lift notched mounting brackets on Card Reader Face Plate out of rectangular holes in cabinet. Lift by Face Plate's bottom tab. Remove Face Plate and set aside.
❑ 4. Lift the topbox glass off of its two bottom support brackets. Gently pull the glass away from the machine until you can see inside the topbox.
❑ 5. If a electrical cable connects to the back of the glass, unplug the cable. Remove the glass. Be particularly careful of fragile shadowboxes that may be glued or taped to the glass. Set the glass aside in a safe place.

Reassembly

❑ 1. Replace the glass. If an electrical cable connects to the back of the glass, plug in the cable.
❑ 2. Replace Card Reader Face Plate.
❑ 3. Switch on GD power at the PDU behind BV.
❑ 4. Close and lock the Main Door.

- **Removing the Topbox Fluorescent Tube**

❑ 1. Unlock and open the Main Door.
❑ 2. Switch off GD power at PDU On/Off switch (behind BV).
❑ 3. Perform *Removing the Topbox Glass* procedures**.**
❑ 4. Carefully grasp the tube. Twist the tube in either direction 1/4 turn (two clicks) until the tube pins come free of the sockets.
❑ 5. Remove the tube.

Reassembly

❑ 1. Slide a new tube into the tube sockets. (Tube type and part number depend on your GD's topbox model. Most machines have an 15W, 18-inch tube: Use WMS part 24-8809.)
❑ 2. Twist the tube either way 1/4 turn.
❑ 3. Replace the glass. If an electrical cable connects to the back of the glass, plug in the cable.
❑ 4. Replace Card Reader Face Plate.
❑ 5. Switch on GD power at the PDU's On/Off switch.
❑ 6. Close and lock the Main Door.

- **Replacing The Topbox Starter**

❑ 1. Unlock and open the Main Door.
❑ 2. Turn off GD power at the PDU.
❑ 3. Perform *Removing the Topbox Glass* procedures**.**
❑ 4. The starter is above the tube on the right. Twist the starter counterclockwise until it pops free.
❑ 5. Remove the starter.

Reassembly

❑ 1. Place the new starter (WMS part 20-9850) in its socket.

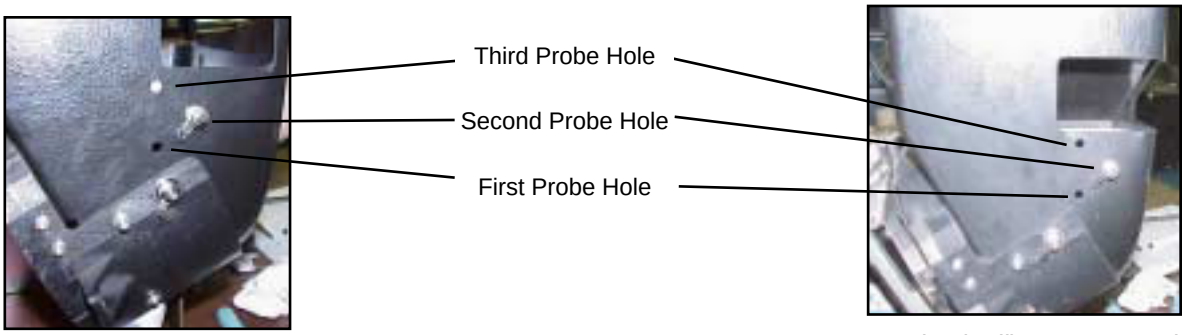
❑ 2. Twist the starter clockwise until it locks in.
❑ 3. Replace the glass. If an electrical cable connects to the back of the glass, plug in the cable.
❑ 4. Replace Card Reader Face Plate.
❑ 5. Turn on GD power at the PDU.
❑ 6. Close and lock the Main Door.

- **Replacing the Tower Light Bulb**
  ❑ 1. Unlock and open the Main Door.
  ❑ 2. Switch off GD power at PDU On/Off switch (behind BV).
  ❑ 3. With an 11/32 nut driver, remove the top nut from the tower light.
  ❑ 4. Remove the tower light dome.
  ❑ 5. Grasp and turn the bayonet bulb counter-clockwise. When the bulb disengages, it pops out.

  Reassembly
  ❑ 1. Insert the new bulb in the socket. Only replace the lamp with a type 1888 bulb! *Other types may cause damage.* Press the bulb down in its socket. Turn the bulb clockwise until it locks in place.
  ❑ 2. Replace the dome and top nut.
  ❑ 3. Tighten the nut with an 11/32 nut driver.
  ❑ 4. Switch on GD power at the PDU.
  ❑ 5. Close and lock the Main Door.

Hopper

- **Filling the Hopper, Setting the Probe Level and Installing Hopper**
  ❑ 1. Unlock and open the Main Door.
  ❑ 2. Switch off GD power at PDU On/Off switch (behind BV).
  ❑ 3. Lift and remove the coin tray.
  ❑ 4. Remove coins from the hopper.
  ❑ 5. Slide the hopper toward you, and out of the cabinet. Sensors and power unplug from the blind mating connector as you slide the hopper out.
  ❑ 6. Check the GD for loose or missing hardware. Missing hardware may have fallen into the hopper. *(Clean it out of there before running the hopper to prevent jams!)*
  ❑ 7. Inspect the hopper: Before filling the hopper with coins, remove dust, dirt, loose hardware and other foreign matter.
  ❑ 8. See the table *Hopper Probe Level.* Adjust the hopper coin-level probe. Move the probe to a *higher* hole if the hopper will hold more coins. *(Hole 6 is not presently used.)* Move the probe to a *lower* hole if the hopper will hold fewer coins.
  ❑ 9. Fill the hopper with coins of the proper denomination. See the *Hopper Probe Level* table to find the optimum number of coins for each coin-level probe hole.
  ❑ 10. Slide the hopper into the cabinet. Sensors and power are reengaged to the blind mating connector as you slide the hopper in.
  ❑ 11. Check that the hopper's mounting base firmly engages both rails of the track.
  ❑ 12. Replace the coin tray.

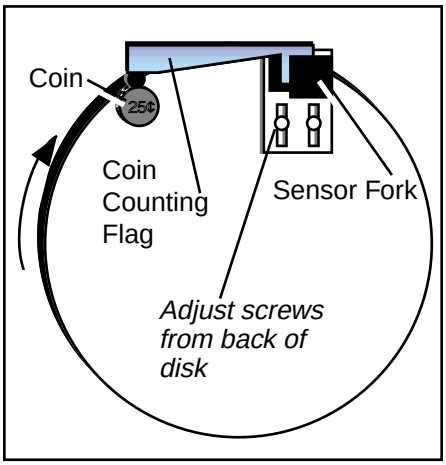


Short Hopper Bowl

Two Tier (Tall) Hopper Bowl

Hopper Probe Level Coin Max Amounts (Aprox.)

Short Hopper	Probe Hole	U.S. $1	25¢	5¢
	3rd	500	2,000	2,700
	2nd	400	1,500	2,000
	1st	300	1,200	1,500
Two-Tier Hopper	**Probe Hole**	**U.S. $1**	**25¢**	**5¢**
	3rd	600	2,200	2,600
	2nd	500	1,800	2,300
	1st	400	1,300	1,800



Coin-Out Sensor (Looking Through Hopper Disk)

❑ 13. Switch on GD power and check the hopper. *Hopper works:* Close and lock the Main Door. *Hopper doesn't work:* Double-check cable connections and the hopper.

❑ 14. Test the Hopper. GD software includes a hopper test in the Config/Test Submenu of Administration Mode (Technician Menu System). If the hopper contains coins, this test dispenses 1 or 10 coins. *(See Chapter 3 of Book 1, 55X SM.)*

- **Vertically Aligning the Hopper Coin-Out Sensor**

❑ 1. Unlock and open the Main Door.

❑ 2. Switch off GD power at PDU On/Off switch (behind BV).

❑ 3. Lift up, disengage and remove the coin tray.

❑ 4. Remove coins from the hopper.

❑ 5. Slide the hopper out. Sensors and power unplug from the blind mating connector as you slide the unit out.

❑ 6. Set the hopper on a table.

❑ 7. Find the motor lock lever on the motor. Release the lever by pushing it down. Spin the hopper shaft.

❑ 8. Stop the hopper when a coin reaches top dead center on the counting lever roller.

❑ 9. The hopper coin-out sensor is a capacitive proximity sensor. Find the black, proximity sensor fork that resides between the circuit board and the motor. This sensor fork straddles the coin counting flag. Two screws allow you to adjust the fork sideways, for best fork-to-flag fit. This first set of screws is above the fork. Two other screws allow you to adjust the fork up and down on

the flag. This second set of screws is below the fork. Loosen the second set of screws. By moving the sensor fork, align bottom edges of the coin counting flag and fork.

❑ 10. Tighten the screws.

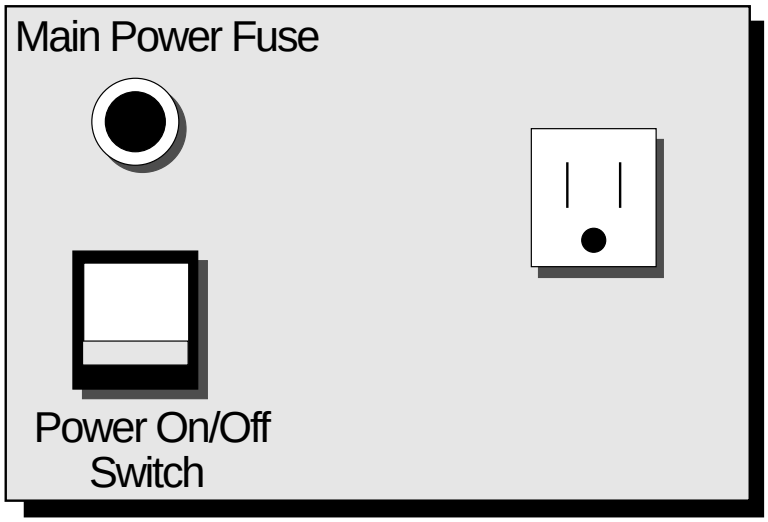
Reassembly

❑ 1. Slide the hopper back into position. Sensors and power reengage at the blind mating connector as you slide the unit in.

❑ 2. Replace hopper coins.

❑ 3. Replace the coin tray.

❑ 4. Switch on GD power at PDU.



PDU Panel Box

❑ 5. Close and lock the Main Door.

❑ 6. Test the hopper. *(See Chapter 3 of Book 1, 55X SM.)*

NOTICE

Proper monitor adjustment will compress the foam tape on the bezel between 50% to 70%.

WARNING

Electric shock hazard! Unplug the gaming device before working on the PDU or power transformer.

Monitor

- **Removing the Monitor**

❑ 1. Switch off GD power at PDU.

❑ 2. Loosen but do not remove the 7/16 flange grip nut located at the front of the monitor shelf, centered under the monitor.

❑ 3. Pull straight down to disconnect molex minifit connector located under the left front side of the monitor shelf.

❑ 4. Slide monitor forward till flange grip nut stops its forward progress *(over the wide part of the keyhole slot)*.

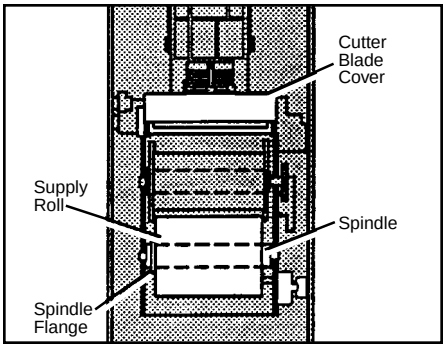
❑ 5. Lift monitor up and out of the gaming device.

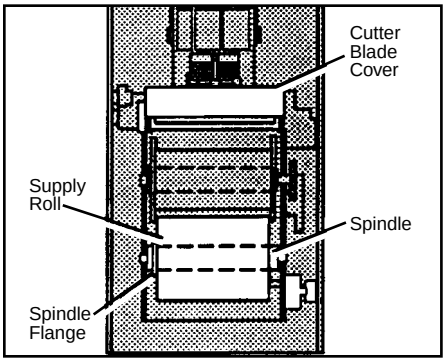
Reassembly

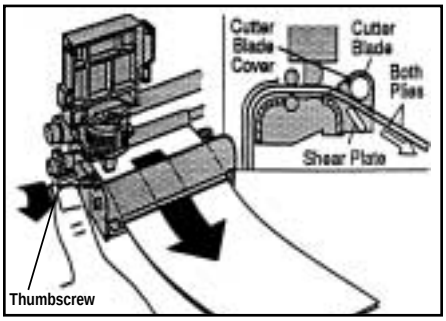
❑ 1. Place the monitor on the monitor shelf and slide it back until the flange grip nut comes up through the keyslot. Do not tighten nut!

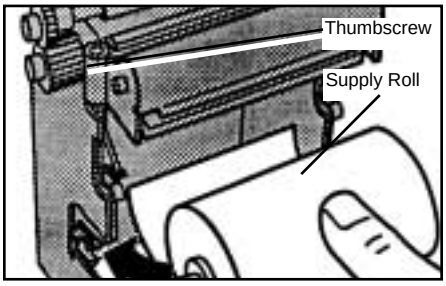
❑ 2. Finger tighten nut.

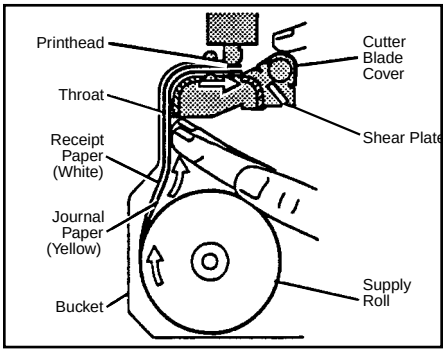
❑ 3. Slide monitor to its forward most position on the shelf.











❑ 2. Close and latch main door. This aligns the monitor's position.
❑ 3. Carefully open the main door. Do not move the monitor.
❑ 4. Tighten flange grip nut.
❑ 5. Reconnect the molex minifit connector through the monitor shelf opening to the monitor.
❑ 6. Switch on GD power at the PDU.
❑ 7. Close and lock the Main Door.

Power Distribution Unit *(PDU)*

- **Replacing the Power Distribution Unit Fuse**
  - ❑ 1. Unlock and open the Main Door.
  - ❑ 2. Switch off GD power at the On/Off switch of the PDU. The main power fuse, as shown above, is mounted on the GD's PDU panel box.
  - ❑ 3. Unscrew the plastic fuse knob.

Reassembly

- ❑ 1. Replace the fuse. (In 120-volt areas, use a 4ASB, 250V fuse. In 220 to 240-volt areas, use a 2ASB, 250V fuse.)
- ❑ 2. Return the fuse knob to its position on the PDU front panel.
- ❑ 3. Twist the plastic fuse knob until it reengages.
- ❑ 4. Switch on GD power at the PDU panel box.
- ❑ 5. Close and lock the Main Door.

Printer (Optional)

- **Changing Paper on the Ithaca Printer**
  (Change the paper when you see the pink stripe on the receipt paper.)

Remove Takeup and Supply Rolls
(The Takeup Roll will not be present on all printers.)

- ❑ 1. Pull out the journal takeup roll.
- ❑ 2. Tear the yellow journal paper off against the shear plate.
- ❑ 3. Unscrew the flange on the spindle's left side. Set the spindle and flange aside.
- ❑ 4. Hold down the printer beak.
- ❑ 5. Pull the used supply roll and paper out of the printer. Set the spindle aside.

Put In the New Supply Roll

- ❑ 6. Squarely tear off the edge of the new supply roll. Use a table edge, etc.
- ❑ 7. Put the spindle in the new supply roll.
- ❑ 8. Put the supply roll in the lower set of snaps.
- ❑ 9. Hold down the printer beak.
- ❑ 10. Push the paper up through the throat until paper emerges past the printhead.

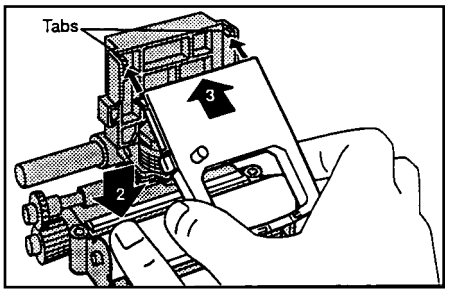
Thread the Paper

- ❑ 11. Turn the thumbwheel gear to advance six inches of paper past the printhead.

❑ 12. Tear off the white paper.
❑ 13. Thread the yellow journal paper down the slot behind the shear plate. Make sure that the white paper goes through the cutter.
❑ 14. Advance the white paper with the thumbscrew. Simultaneously hold up the printer beak lever (below left side of beak).

Replace the Takeup Roll

❑ 15. Screw the flange back onto the spindle. (The smooth side of the flange must face the paper.)
❑ 16. Fold the free edge of the journal paper back about a half inch.
❑ 17. Insert the fold into the takeup spindle groove. The gear should face right.
❑ 18. Return the takeup spindle and rotate it on the upper set of snaps.
❑ 19. Run a test print from the Printer Test window.



Changing the Ribbon Cassette

- **Changing the Ribbon Cassette**
  Change the ribbon cassette when the print becomes faded. If you leave the ribbon cassette in too long, the ribbon may tear.

  Remove the Used Cassette

  ❑ 1. Unlock and open the the Main Door.
  ❑ 2. Switch off GD power at the PDU.
  ❑ 3. Push and hold down the printer beak during this entire step. Tilt the bottom of the ribbon cassette out and free. Slide the cassette down. Remove the ribbon cassette from the printer.

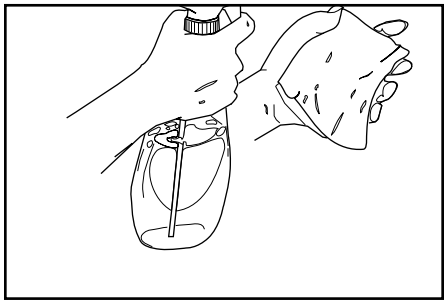
  Put in the New Cassette

  ❑ 1. Prepare the ribbon cassette by turning its cassette knob clockwise.
  ❑ 2. Push and hold down the printer beak during this entire step. Slide the top of the ribbon cassette into place. Engage the bottom of the cartridge.
  ❑ 3. Switch on GD power at the PDU.
  ❑ 4. Close and lock the Main Door.

- **Cleaning the Printer**
  Periodically use a vacuum cleaner or air compressor to remove paper dust. Don’t use alcohol or petroleum-based chemicals to clean the printer. These cleaners damage plastic parts. The carriage rack is particularly sensitive. These chemicals will ruin it. Take care not to get the cleaner on electronic components.

Touch Screen

- **Cleaning the Touch Screen**
  Use a 99 percent alcohol cleaning solution to clean the Touch Screen. This type of cleaning liquid evaporates rapidly and doesn't drip. You can use other alcohol-based cleaners, but *never spray them directly on the screen.* Instead, *spray a cloth* and wipe the screen with it. *Never* use abrasive cleansers or ammonia-based cleansers on the Touch Screen.


Spray cloth and wipe Touch Screen

Notes

NOTICE

This Chapter covers Game Software through OS Version 2.28.

Chapter 3. Troubleshooting

Candle Codes

Candle Section	Candle Activity	Meaning
Top	Off	Machine is idle
	On	Change request
	Slow Flash	Tilt or Jackpot Mode
Bottom	Off	Main door closed
	Fast Flash	Main door open
	Slow Flash	Jackpot

Candle Codes

The two-stage candle on top of the machine indicates VGD status. The VGD employs both levels of the candle to convey information about its operation. See the *Candle Codes* table at right.

Tilt Codes

When the machine enters Tilt Mode, a mnemonic tilt code appears on the monitor. See the *Tilt Codes* table. (More detailed tables later in this chapter cover all these tilts.) There are several types of tilt codes...

CPU Board EEPROM Tilts

CPU Board tilts indicate data errors in the CPU Board's Security EEPROM chip. To clear CPU Board tilts, press the DIAGNOSTIC Button.

CPU EPROM Tilts

This machine only has one EPROM tilt. The screen message "ROM Checksum Error" implies a bad CPU Board EPROM. To clear CPU EPROM tilts, replace the board or the chip. Then clear the RAM.

DBV/Coin Mech Tilts

DBV and Coin Mech tilts involve problems with the bill validator and coin comparator. To clear DBV and Coin Mech tilts, turn the ADMINISTRATOR KEY. Coin Mech "Long Coin" tilts self-clear after 25 seconds.

Door Access Tilts

Door access tilts provide information on the Stacker, Logic Door, Drop Door and Bill Door. An open door or missing stacker produces a tilt. To clear door access tilts, close the open door.

Hand Pay Situation Tilts

The tilt "JACKPOT! Call Attendant" announces a hand-pay situation. (The attendant must pay the player.) To clear hand pay situation tilts, turn the ADMINISTRATOR KEY.

Hard Meter Tilts

Hard meter tilts describe improper operation of hard meters on the side of the game. These sturdy, electromechanical meters report important game statistics. Electromechanical meters offer a degree of data security, because you can't reset them. Yet despite their ruggedness, hard meters occasionally fail. Hard meter tilts log such hard meter failures. To clear hard meter tilts, turn the ADMINISTRATOR KEY.

Hopper Tilts

Hopper tilts report hopper maladies. These maladies can involve either electronic or mechanical problems, and hopper tilts cover

NOTICE

WHERE IS THE DIAGNOSTIC BUTTON? Many of these tilt descriptions refer to the DIAGNOSTIC Button.

•*19" Slant Top GDs:* You'll find the white, DIAGNOSTIC Button behind the hinge side of the Electronics Door. Look near the coin drop chute.

•*19" Upright GDs:* You'll find the white, DIAGNOSTIC Button on the lower-left side of the card cage.

•*17" Upright GDs:* You'll find the white, DIAGNOSTIC Button under the monitor and near the bill validator.

•*14" Bartop GDs:* You'll find the white, DIAGNOSTIC Button under the hard meters and behind the Main Door.

NOTICE

WHERE IS THE MAIN DOOR? Diagnostic messages refer to the "Main Door."

In Slant Top Video machines, the Main Door is the Electronics Door.

In upright machines, the Main Door is the Front Door.

both possibilities. To clear hopper tilts, turn the ADMINISTRATOR KEY.

Printer Tilts
Printer tilts communicate printer problems. For instance, a printer tilt might occur if the printer runs out of paper. If printer-to-CPU communications fail, you might also see a tilt message. To clear printer tilts, switch the gaming device off and on.

Programmable Gate Array *(PGA*) Tilts
PGA *(Programmable Gate Array)* tilts alert you to failures of the Xilinx® PGA chip. The PGA chip is a unique, dynamically programmable communications chip. It resides on the I/O Board. See the *I/O Block Diagram.* Notice that PGA chip XU41 primarily handles peripheral switch inputs. To clear PGA tilts, turn the ADMINISTRATOR KEY.

Static RAM Tilts
Static RAM tilts signal errors in data stored in the VGD computer's CMOS static RAM chips. To clear static RAM tilts, clear the RAM.

Touch Screen Tilts
Touch Screen tilts occur when communications between the Touch Screen Controller and I/O Board fail. Communications breakdowns may result from bad cables, or from connectors or chips on circuit boards. Signals between the Touch Screen and the I/O Board also pass through the Backplane Board. To clear Touch Screen tilts, turn the ADMINISTRATOR KEY

T**op Box, LCD, Communication Tilts.**
These tilts can occur when communication between the Top Box and the game breaks down. Video memory and ROM corruption faults are examples of this type of tilt.

Top Box, Monopoly Board Tilts
These tilts pertain to the communication faults that occur between the Monopoly Board in the Top Box and the game. Faults such as Dice Not Detected, Memory Corrupt, and Noise In Communication are typical examples.

Bill Validator and Coin Mechanism Tilt Guide

Symptom	Probable Cause	Solutions
"Bill Stacker Missing" appears on monitor	1. No stacker 2. Bent STACKER switch mounting bracket 3. Bad stacker cable 4. Bad STACKER switch 5. Bad STACKER switch input on I/O Board	1. Replace stacker in bill validator. 2. Bend back the bracket. 3. Repair or replace cable. 4. Replace switch. 5. Service input or replace I/O Board
• "Bill Validator Communication Fault" appears on monitor screen • External (green) bill validator LEDs are out	1. Faulty cable from BV to I/O Board 2. I/O Board communication failure 3. Bill validator failure	1. Check or replace BV data cable. 2. Replace faulty I/O Board, or service DBV communication link. 3. Replace bill validator. Check new BV by running the Currency Test.
• Bill Validator (BV) won't accept currency • "Invalid Bill" appears on monitor screen	1. Bad bill 2. Bad or disabled BV 3. Loose BV power connections 4. Dust and dirt 5. Wrong DIP switch settings 6. Bad data cable 7. Bad I/O Board	1. Try another bill. 2a. Machine accepts coins: Does BV take bill in and then spit it out? Yes: Bill may put machine over hopper payout limit. No: Replace BV. 2b. Machine doesn't accept coins: Locked out machine, open door or tilt. Clear tilts and shut door. 3. Check for 120 VAC at power cable, or for loose connections. 4. Clean BV with BV cleaning pad. 5. Check DIP switch settings. 6. Repair or replace bad cable. 7. Replace I/O Board.
• "Bill Validator Jam" appears on monitor screen • External (green) bill validator LEDs are out	1. Full bill validator (BV) stacker 2. Jammed bill validator (BV)	1. Collect stacker cassette and replace it with an empty one. 2. Clear the jam and test the BV in Admininstration Mode.
Coins don't drop	1. Coin jam in coin chute 2. Someone inserted coin that was too large 3. Mismounted coin mech	1. Find jam location by looking through coin chute slits. 2. Carefully dislodge coin. 3. Remount coin mech.
"Coin Jam" appears on monitor screen	1. Coin jam 2. Dirty or faulty Opto Board	1. Clear coin jam. 2a. Can't clear tilt by cycling power? Opto Board may be faulty. Use Input Test to check for proper switching. Display should read "0" with no coins in chute. 2b. Opto Board fails test? Clean or replace board.
• Coins jam comparator • VGD doesn't give credits	1. No sample coin in coin comparator's sample coin retainer 2. Bad comparator	1. Insert nominal coin in sample coin retainer. Coin should neither be worn nor brand new. 2. Replace comparator.
Comparator won't accept coins	1. No power to comparator (LED is off) 2. Bad sample coin 3. Maladjusted comparator accept/ reject potentiometer 4. Bad comparator	1. Check power cable. If cable's open or shorted, replace it. 2. Replace sample coin. 3. Adjust accept/reject selectivity at comparator potentiometer. 4. Replace comparator.
"Long Coin" appears on monitor	Long Coin (Coin took too long between detector optos.)	Player tried strung coin.
VGD doesn't give credits	1. Bad harness between comparator and opto 2. Bad Opto Board 3. Bad I/O Board	1. Replace comparator. 2. Repair or replace Opto Board. 3. Repair or replace I/O Board.
"Reversed Coin" appears on monitor	Reversed coin	Player tried to remove a coin with string or similar device.
"Bill ValidatorCurrency Type \ Denomination Mismatch" Monitor Tilt	An incorrect BV or RAM clear is installed	Install correct BV or RAM clear. Repeat RAM clear.
"Bill Validator Failure" appears on monitor	Bill Validator has reported failure or error.	1. Verify problem: Do typ. currency test. 2. Reset BV by removing and replacing Bill Stacker.
"Bill Validator Cheated" appears on monitor	Bill Validator has been cheated (BV did not award credits for bill).	1. Check Bill Log. Perform typical bill test 2. Reset BV by removing and replacing Bill Stacker.
"Bill Validator Stacker Full" appears on monitor	Bill Validator stacker is full.	1. Check stacker cassette, switch, switch harness, and I/O board. 2. Empty stacker and place back in GD.

Button and Switch Guide

Symptom	Probable Cause	Solutions
Button: A Player Panel button doesn't operate	1. Loose cable connection at top of Backplane Board 2. Bad player panel wiring 3. Bad switch 4. Bad switch wiring 5. Bad Faston® connector 6. Bad switch inputs on I/O PC Board	1. Plug cable in securely. 2. Repair or replace player panel cable. 3. Replace switch. 4. Rewire switch. 5. Replace connector at button. 6. Service input or replace I/O Board.
Button and Switch: Opening and closing any door or pressing DIAGNOSTIC Button fails to clear error messages	1. System halt 2. Loose connection at switch	1. Turn power off and wait three seconds. Then turn power on. 2. Repair connection.
Button Lamp: A Player Panel button lamp doesn't light	1. Bad bulb 2. Loose cable connection at top of Backplane Board 3. Bad player panel wiring 4. Bad Faston® connector 5. Bad switch wiring 6. Bad lamp output on I/O Board	1. Replace bulb. 2. Plug cable in securely. 3. Repair or replace player panel cable. 4. Replace connector at button. 5. Rewire switch. 6. Service output or replace I/O Board.
Switch: ADMINISTRATOR KEY switch doesn't operate	1. Bad switch 2. Bad cable harness 3. Bad Faston® connector 4. Bad switch input on I/O Board	1. Replace switch. 2. Repair or replace harness. 3. Replace connector at Backplane Board or I/O Board. 4. Service input or replace I/O Board.
Switch: Door switch doesn't operate	1. Bad switch 2. Bad switch cable 3. Bent, maladjusted or missing actuator bracket 4. Bad switch wiring 5. Bad switch input on I/O Board	1. Replace switch. 2. Repair or replace switch cable. 3. Straighten, adjust or replace bracket. 4. Rewire switch. 5. Service input or replace I/O Board.

Communication Guide

Symptom	Probable Cause	Solutions
No Communication **NOTICE** Report error codes to central communication site for evaluation and processing. Codes enable use of advanced diagnostic facilties.	1. Wrong protocol setting. 2. Bad power line to slot machine. 3. Blown main PDU fuse (4ASB on 120V GDs; 2ASB on 240V GDs). 4. Bad communication cables. 5. Bad external communication power supply. 6. Bad I/O Board.	1. Enter Administation Mode and set GD communications to proper protocol. 2. Make sure that slot machine is on live circuit. 3. If fuse is bad, replace it. 4. If cables are bad, repair or replace them. 5. If your GD has external communication power supply, replace it. 6. Replace I/O Board and rerun test.

CPU Board 7-Segment Display Guide

Symptom	Probable Cause	Solutions
CPU Board display is blank	1. Constantly ("8" never appears): Logic isn't receiving power 2. After "8" clears (after power-up): Game OK	1. Check LEDs on I/O Board to see which power supply voltage is absent. Then see Power Troubleshooting Guide. 2. Return game to operation.
CPU Board displays "8"	• Briefly, at power-up: Game OK • "8" remains on: Dead CPU Board	1. Constant "8": Remove and reseat CPU and IO Boards. Rerun test. 2. Constant "8" again: Replace EPROMs XU2, XU3. Save old ones. Rerun test. 3. After test, "8" appears and remains on: Dead CPU. Original EPROMs are good. Swap CPU Board. Rerun test.

CPU Board EEPROM Tilt Guide

Symptom	Probable Cause	Solutions
"Secure Memory CRC Corrupt" appears on monitor	Bad CPU Secure EEPROM	1. Check each EEPROM by substituting good part. 2. Replace bad EEPROM.
"Illegal Secure Memory Device!" appears on monitor	CPU EEPROM not correct	1. Check each EEPROM by substituting good part. 2. Replace bad EEPROM.
"Secure Memory Incorrect Password" appears on monitor	1. Someone changed EEPROM or CPU Board 2. Bad CPU EEPROM	1. Return original chip or CPU Board to card cage, or press DIAGNOSTIC. 2. Check or replace suspected EEPROM.
"Secure Memory Options Updated" appears on monitor	Someone accessed restricted options with a secure device (EEPROM).	To clear the message, turn the ADMINISTRATOR KEY or press DIAGNOSTIC.
"Secure Memory Failure" appears on monitor	Bad CPU EEPROM	1. Check each EEPROM by substituting good part. 2. Replace bad EEPROM.
"Secure Memory Game Busy" appears on monitor	Game was busy when percentage key was inserted.	To clear the message, turn the ADMINISTRATOR KEY or press DIAGNOSTIC.
"Secure Memory EFT Key Error" appears on monitor	Game doesn't support EFT or wrong key. EFT key is inserted after Hard RAM Clear instead of during.	Remove EFT key & apply power cycle. Do Hard RAM Clear.
"Backplane Serial Number Mismatch" appears on monitor	CPU serial number doesn't match backplane value.	Replace original CPU board. Do Hard RAM Clear.
"Missing or Bad Deleware ID" appears on monitor	VLC terminal ID part is bad or missing	For DE and NM overlapping functionality
"Missing or Bad Secure ID (XU27)" appears on monitor	Secure ID part is bad or missing.	Replace bad EEPROM. (Refers to lottery games only.)

CPU EPROM Tilt Guide

Symptom Message	Probable Cause	Solutions
"ROM Checksum Error" appears on monitor.	1. Bad CPU Board EPROM XU2 2. Bad CPU Board EPROM XU3 3. Bad data bus bits on CPU Board 4. Bad buffer, etc. on CPU Board data bus	1. Replace EPROM XU2. Clear RAM and restart machine. Look for repeat of "ROM" diagnostic message. No message: Problem solved! 2. Replace EPROM XU3. Clear RAM and restart machine. Look for repeat of "ROM" diagnostic message. No message: Problem solved! 3. Message repeats: Replace CPU Board or bench test bus. 4. Bench test bus devices.
"ROM Table Display Index Error" appears on monitor.	Game paytable lookup error (only in 3-reel video products)	1. Apply Power Cycle. 2. Do Hard Ram Clear.
"Reel Stop Position Error" appears on monitor.	Reel game specific game error (only in reel games)	1. Apply Power Cycle. 2. Do Hard Ram Clear.
"ROM Table Lookup Error" appears on monitor.	Game paytable lookup error (only in 3-reel video products)	1. Apply Power Cycle. 2. Do Hard Ram Clear.
"ROM Table Product Range Error" appears on monitor.	Game paytable lookup error (only in 3-reel video products)	1. Apply Power Cycle. 2. Do Hard Ram Clear.
"ROM Signature Mismatch-Please Perform RAM Clear" appears on monitor.	ROMs changed without a RAM clear	1. Apply Power Cycle. 2. Do Hard Ram Clear.

CPU Startup Sounds Guide

Symptom	Probable Cause	Solutions
No startup bong	1. Disconnected speaker 2. Sound circuit problem	1. Check speaker wiring continuity. 2. Replace the I/O Board.
1 startup bong	Normal system	Proceed with next test.
2 startup bongs	Bad CPU Board EPROM XU30	1. Replace XU30, clear RAM, retest game. 2. Check/verify sound jumper is set correctly.
3 startup bongs	Bad CPU Board EPROM XU31	Replace XU31, clear RAM, retest game.
4 startup bongs	Bad CPU Board EPROM XU17	Replace XU17, clear RAM, retest game.
5 startup bongs	Bad CPU Board EPROM XU18	Replace XU18, clear RAM, retest game.
6 to 9 startup bongs	Not used	Recount number of bongs.
10 startup bongs	Bad Sound RAM U38, U39 or U40, or DSP chip XU37: All chips are on CPU Board	1. Replace bad chip, clear RAM and retest machine. 2. Run Sound Tests.

CPU Jumper Guide

CPU 1.5 Jumper J2 Position **(A-17677-03)**	**Explanation**
From "P7" to "P7 OUT"	CPU Board contains 8 meg sound EPROMs.
From "P7 OUT" to "+5"	CPU Board contains 4 meg sound EPROMs.
CPU 1.5+ Jumper Position **(A-004275-03)**	**Explanation**
JP2 jumper from P1 to P2 JP2 jumper from P2 to P3	Whenever a 4M EPROM or smaller is used (XU2 through XU5) Whenever an 8M EPROM is used (XU2 through XU5)
JP3 jumper from P1 to P2 JP3 jumper from P2 to P3	Whenever a 4M EPROM or smaller is used (XU17, XU18, XU30, XU31) Whenever an 8M EPROM is used (XU17, XU18, XU30, XU31)

Door Tilt Guide

Symptom	Probable Cause	Solutions
"Bill Door Open" appears on monitor	1. Open Bill Door 2. Maladjusted BV OPEN switch 3. Bent switch mounting bracket 4. Bad BILL DOOR switch 5. Bad BILL DOOR switch wiring 6. Bad BILL DOOR switch cable 7. Bad BILL DOOR switch input on I/O Board	1. Close and lock Stacker (bottom BV) Door. 2. Adjust switch. 3. Straighten or replace bracket. 4. Replace switch. 5. Repair or replace wiring. 6. Repair or replace switch cable. 7. Service input or or replace board.
"Drop Door Open" appears on monitor	1. Open Drop Door 2. Bad DROP DOOR switch 3. Bad DROP DOOR switch wiring 4. Bad DROP DOOR switch cable 5. Bad DROP DOOR switch input on I/O Board	1. Close and lock Drop Door. 2. Replace switch. 3. Rewire switch. 4. Repair or replace switch cable. 5. Service input or replace I/O Board.
"Bill Jam Service Door Open" appears on monitor	1. Maladjusted switch 2. Open Bill Jam Service Door 3. Bad BILL JAM SERVICE switch 4. Bent BILL JAM SERVICE switch mounting bracket 5. Bad BILL JAM SERVICE switch wiring 6. Bad BILL JAM SERVICE switch cable 7. Bad BILL JAM SERVICE switch input on I/O Board	1. Adjust switch. 2. Close and lock door. 3. Replace switch. 4. Bend back bracket. 5. Rewire switch. 6. Repair or replace switch cable. 7. Service input or replace I/O Board.
"Logic Door Open" appears on monitor	1. Open Logic Door (Card Cage Door) 2. Bad CAGE DOOR switch 3. Bad CAGE DOOR switch wiring 4. Bad CAGE DOOR switch cable 5. Bad CAGE DOOR switch input on I/O Board	1. Close Card Cage Door. 2. Replace switch. 3. Rewire switch. 4. Repair or replace switch cable. 5. Service input or replace I/O Board.
"Main Door Open" appears on monitor	1. Open Main Door or Printer/Hopper Door 2. Bad door switch (Main Door or Printer/Hopper Door) 3. Bad door switch wiring 4. Bad door switch cable 5. Bad door switch input on I/O Board	1. Close and lock Main Door and Printer/Hopper Door. 2. Replace switch. 3. Repair or replace wiring. 4. Repair or replace cable. 5. Service input or or replace board.
"Monitor Hatch Door Open" appears on monitor	1. Open Monitor Hatch 2. Bad HATCH switch 3. Bent HATCH switch mounting bracket 4. Missing HATCH switch actuator bracket. 5. Bad HATCH switch wiring 6. Bad HATCH switch cable 7. Bad HATCH switch input on I/O Board	1. Close and lock Monitor Hatch. 2. Replace HATCH switch. 3. Straighten or replace bracket. 4. Replace bracket. 5. Repair or replace wiring. 6. Repair or replace cable. 7. Service input or or replace board.
"Reserved Door Open" appears on monitor	The Reserved Door is open	Close Reserved Door. Check door switch and cable

Hand Pay Situation Tilt Guide

Symptom	Probable Cause	Solutions
"HAND PAY xxxxx CREDITS" and "PLEASE WAIT FOR ATTENDANT" alternately appear on the monitor display	Hopper can't pay this amount (this amount exceeds Maximum Hopper Payout Limit). These banners have a green backround. If payout is player initiated, the same messages appear but with a blue backround.	Attendant must pay player xxxxx credits.
"JACKPOT!–Call Attendant" appears on display	Hopper can't pay the jackpot	Attendant must pay player.

Hard Meter Tilt Guide

Symptom	Probable Cause	Solutions
All hard meters fail to increment	1. Bad Meter Board cable 2. Bad Meter Board 3. Bad I/O Board or CPU Board	1. Check these DC voltages at Meter Board end of 12-pin Meter Board cable... • +12V, pin 11 • +5V, pin 2 Missing voltage or voltage reads low: Repair or replace cable. 2. Voltage checks OK: Replace Meter Board. 3. Replace faulty PC board.
"Mechanical Meter #%d Failure" appears on display #%d =number of meter • One or more hard meters doesn't increment-No tilt message appears	Bad connection to meter... •19" Slant and Upright, Bartop: Meter numbers proceed from left to right and top to bottom. Top meters: 1, 2, 3. Bottom meters: 4, 5, 6. •17" Upright: Meter numbers proceed from top to bottom. Bad meter	1. With power off, perform a continuity test between I/O Board, Meter Board and meter. 2. Tighten loose connections. 3. Repair or replace bad cable. Locate the bad meter and replace it. (Refer to jurisdiction rules about meter replacement.)

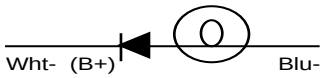
Hopper Tilt Guide

Symptom	Probable Cause	Solutions
"Hopper Empty" appears on display, indicating empty hopper.	1. Empty or low hopper: Check it, and refill it if necessary. 2. Coin jam 3. Hopper probes 4. Coin-out sensor harness continuity 5. Coin-out sensor	1. Refill hopper. 2. Clear jam. Clear tilt by turning ADMINISTRATOR KEY or pressing DIAGNOSTIC button. Run Hopper Test. Watch hopper for bent or malfunctioning parts. Replace bad parts. 3. Hopper's full, but not jammed: Swap coin-out sensor cables. Clear tilt by opening and closing main door. Run Hopper Test. 4. Test hopper probes by swapping them with known-good ones. 5. Adjust coin-out (proximity) sensor. If problem persists, replace sensor. Clear tilt and rerun Hopper Test.
"Hopper Extra Coin Paid" appears on display	Hopper dispensed extra coin (appears after hopper dispenses 10 extra coins per 5,000 dispensed coins)	1. Clear tilt by turning ADMINISTRATOR KEY or pressing DIAGNOSTIC button. 2. Run Hopper Test. 3. Check hopper's electromechanical brake. 4. Adjust coin-out (proximity) sensor.
"Hopper Jam" appears on display, indicating hopper jam.	1. Hopper brake, motor, etc. 2. Coin-out sensor harness continuity 3. Coin-out sensor	1. Clear jam. Clear tilt by turning ADMINISTRATOR KEY or pressing DIAGNOSTIC button. Run Hopper Test. Watch hopper for bent or malfunctioning parts. Replace bad parts. 2. Hopper's not jammed: Check or swap hopper power and coin-out sensor cables. Clear tilt and rerun Hopper Test. 3. Adjust coin-out (proximity) sensor. If problem persists, swap sensor. Clear tilt and rerun Hopper Test.
"Hopper Runaway" appears on display, indicating runaway hopper	1. Coin-out sensor 2. Faulty hopper data cable 3. Faulty hopper communication link 4. Faulty hopper mechanics 5. Faulty Hopper Driver Board 6. Faulty I/O Board	1. Adjust coin-out (proximity) sensor. Clear tilt by turning ADMINISTRATOR KEY or pressing DIAGNOSTIC button. Run Hopper Test. If problem persists, replace sensor. 2. Repair or replace cable. 3. Service communication link. 4. Replace faulty hopper mechanics. 5. Repair or replace Hopper Driver Board: Test hopper SSR for leakage. Bad SSR? Replace it. 6. Replace faulty I/O Board.

Lamp Matrix Guide

Symptom	Probable Cause	Solutions
One entire column of lamps doesn't work	1. Bad column driver darlington 2. Bad cable 3. Failure in column drive electronics before darlington	1. Replace bad driver 2. Repair or replace lamp cable 3. Troubleshoot and repair column drive circuit. See nearby theory drawing.
One entire row of lamps doesn't work	1. Bad row driver darlington 2. Bad cable or connector 3. Failure in row drive electronics before darlington	1. Replace bad driver 2. Repair cable or connector 3. Troubleshoot and repair row drive circuit. See nearby theory drawing.
More than one lamp comes on at once	Shorted lamp matrix diode	Check diodes in same row and column as lamp that shouldn't be lighting. Each lamp has diode in series with it.
One lamp doesn't come on	1. Burned out bulb 2. Open lamp diode 3. Bad PC board trace 4. Bad cable or connector	1. Replace bulb. 2. Replace diode. 3. Repair trace. 4. Repair or replace lamp cable.

Lamp Matrix



ROW \ COL	0 Wht-Blk Q3	1 Wht-Brn Q4	2 Wht-Red Q7	3 Wht-Orn Q8	4 Wht-Yel Q11	5 Wht-Grn Q12	6 Wht-Blu Q15	7 Wht-Vio Q16
Blu-Blk Q1 0	Hard Meter Lamp 1	9	17	25	33	41	49	57
Blu-Brn Q2 1	2	10	18	26	34	42	50	58
Blu-Red Q5 2	3	11	19	27	35	43	51	59
Blu-Orn Q6 3	4	12	20	Blu (No 28	36	44	52	60
Blu-Yel Q9 4	5	13	21	Hold 1 29	Hold 2 37	Hold 3 45	Hold 4 53	Hold 5 61
Blu-Grn Q10 5	6	14	Player Panel Btn 11* 22	30	Player Panel Btn 12* 38	DBV LED 2 46	DBV LED 3 54	62
Trace) Q13 6	7	15	23	31	39	Tower Lamp, Bottom 47	Tower Lamp, Middle 55	Tower Lamp, Top 63
Blu-Vio Q14 7	Max Bet 8	Play 16	Bet 1 24	Collect 32	40	48	56	64

*Used on 12-button player panel.

NOTICE

The lamp matrix of some gaming devices may include fewer or additional lamps.

Monitor Guide

Symptom	Probable Cause	Solutions
Dark screen (No picture or raster) **WARNING** ONLY QUALIFIED PERSONNEL SHOULD PERFORM ADJUSTMENTS WHILE THE MONITOR IS UNDER POWER.	1. Misaligned blind mating connector 2. Wrong brightness or contrast settings. 3. No power to monitor 4. No video signal to monitor 5. Bad monitor power supply 6. Bad horizontal output transistor or damper diode 7. Overvoltage condition at flyback transformer activated shutdown circuit 8. Faulty startup circuit **NOTICE** Consult your monitor manual for specifics on circuit theory, controls, troubleshooting and schematics.	1. Align connector plug and jack. 2. Correct brightness and contrast control settings. 3. No output on power chassis for 120 VAC: Replace power chassis. 4. Check for bad or loose video cable. Repair or replace bad cable. Secure loose cable. 5. Replace power supply or monitor. 6. Replace transistor. Test damper diode, retrace tuning capacitors and associated components before restarting monitor. 7. With variac, test monitor at reduced input voltage. Replace out-of-spec components in horizontal circuit. 8. Test monitor with alternate power supply. Then repair startup circuit.
Missing color (Red, green or blue)	1. Misaligned blind mating connector 2. Improper color adjustment 3. Open color gun driver transistor 4. Broken cable to neck board. 5. Fault in monitor's video preamp 6. Low emission from one color gun **NOTICE** Consult monitor manual for specifics.	1. Align connector plug and jack. 2. Display color bars in Administration Mode. Adjust chassis and neck board color controls. 3. Replace transistor or monitor. 4. Repair or replace cable or neck board. 5. Replace preamp (an IC in most monitor models) or monitor. 6. Rejuvenate CRT. (Computer service bureau can do that.)
• Picture is far too short to fill screen • Screen displays horizontal line, but no picture	1. Improper vertical size setting 2. Bad vertical power amp in monitor 3. Bad deflection amp in monitor **NOTICE** Consult monitor manual for specifics.	1. Adjust vertical size control. 2. Replace vertical power transistors or IC. 3. Replace vertical deflection IC. (In many monitors, deflection and power stages are part of same IC.)
Keystoned raster	Shorted turns in monitor yoke	Replace yoke or monitor.
Screen only displays raster	1. Misaligned blind mating connector 2. Incorrectly inserted EPROMs 3. Disconnected video cable 4. Bad Video Daughter Card 5. Bad EPROMs or CPU Board 6. Broken wires inside video cable connector 7. Dead video preamp power supply in monitor 8. Bad video preamp IC in monitor **NOTICE** Consult your monitor manual for specifics on circuit theory, controls, troubleshooting and schematics.	1. Align connector plug and jack. 2. With power OFF, inspect U2 and U3 on the CPU Board. Make sure chips aren't reversed (according to labels on board). Reposition improperly inserted chips. 3. Check video cable to make sure it's properly seated. Make sure pins aren't bent. 4. Replace Video Card. 5. Check EPROMs. If they're OK, replace CPU Board. 6. Repair or replace video cable. 7. Replace power supply components or monitor. 8. Replace IC or monitor.
Solid colors seem to be contaminated with shades of wrong color **WARNING** ONLY QUALIFIED PERSONNEL SHOULD PERFORM THIS PROCEDURE! THIS PROCEDURE REQUIRES ADJUSTMENTS WHILE THE MONITOR IS UNDER POWER.	Monitor's purity or static convergence magnets are out of alignment **NOTICE** Consult your monitor manual for specifics on circuit theory, controls, troubleshooting and schematics.	1. Enter Administration Mode. Display each purity (solid color) screen. 2. For each screen, rotate purity magnets (around CRT neck) until color is as pure as possible. 3. Check your work by displaying the crosshatch pattern. Grid lines should be white. Readjust magnets until at least center lines are white. Lines at extreme edges may display some slight color contamination.
Splotches of color mar picture	Picture tube picked up magnetic charge	1. Use external degaussing coil to degauss monitor. (Built-in coil probably isn't powerful enough to restore picture fidelity.) 2. Test monitor with purity (solid color) and color bars screens in Administration Mode.

Power Guide

Symptom	Probable Cause	Solutions
All I/O Board LEDs light	Bad or loose CPU Board or I/O Board	1. Turn off VGD power. Reseat boards in the Backplane Board. 2. Retest VGD. 3. VGD seems normal now: Proceed with next test. Same symptom: Test each board by substitution. Replace bad boards.
No I/O Board LEDs light	Blown PDU fuses	1. With VOM, check fuses for continuity. 2. Replace bad fuses.
• On I/O Board, "DS1" LED is on. • Another I/O Board LED is off.	Bad power supply	Replace bad supply.
Partial Power Failure... • Monitor is black, but seems to have high voltage (Screen attracts hair; may flicker occasionally) • Bill validator initializes normally	1. Missing card cage power: With VGD on, check I/O Board LEDs (Left to right): +5VI*, +12V, -12V, +5V, +18V. 2. PDU failure: Check voltages at PDU's DC power connector... • Pin 13 = PFD (Power Fail Detect) • Pin 16 = +5VI* • Pin 14 = +12V • Pin 15 = –12V • Pin 17 = GND(I) • Pins 18, 19 = Approx 22VDC, no load • Pins 20-22 = +5V • Pins 1-12, 23, 24 = GND (NOTE: These voltages have +/– tolerances.) 3. Improperly inserted EPROMs 4. Bad CPU or I/O Board *NOTES: •+5VI refers to the isolated +5-volt switcher in the PDU. (Other +5V supply isn't isolated.) •+18V supply is only linear supply. Its LED remains on for few seconds after you shut off power. Other supplies are switchers.	1. Wrong or Missing Voltages at I/O Board: Check backplane, cables, PDU. Repair or replace bad parts. 2a. Wrong or Missing Voltages at PDU: Replace bad switching power supply (inside PDU). 2b. Proper voltages at power supply, but not at card cage: Repair or replace power cables. 3. EPROMs inserted backwards may be damaged. Replace them. 4. Voltages are good, but DS1 "Fail" LED is on. (DS1 is on I/O Board, near DIP switches and cage door.) Also, "bong" didn't sound at power-up: Replace CPU Board and retest. If DS1 lights again, try original CPU Board and fresh I/O Board. If DS1 lights again, replace both boards and retest machine.
Total Power Failure... • No hopper action • No sound • Dead monitor • Logic doesn't start up	1. Fuse on PDU 2. AC power line in 3. Bad PDU output 4. Faulty line cord	1. Replace fuse. 2. Turn on circuit breaker or service electrical outlet. 3. Check all PDU outputs with a digital voltmeter. Repair or replace Power Distribution Unit (PDU). 4. Replace line cord.

Printer Tilt Guide

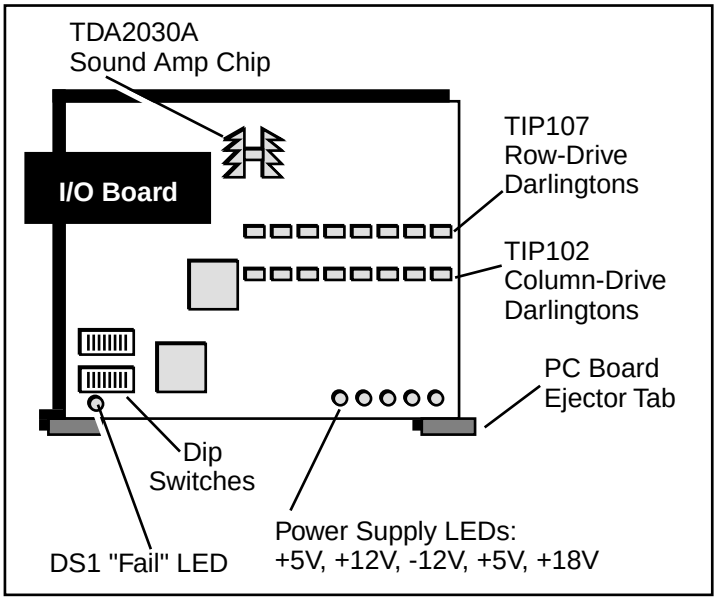
Symptom	Probable Cause	Solutions
Printer Malfunction • Tilt condition: 1. "PRINTER ERROR" 2. Printer is printing "garbage"	1. Several possible causes... • Printer switch is turned off. • Unplugged or damaged power cord • Unplugged or damaged flat cable. • Paper jams inside printer. 2. Printer buffer contains unusable data	1. Solutions to "PRINTER JAM" tilt... • Make sure that printer switch is on. • Reconnect unplugged cable. Repair or replace bad cable. • Clear paper jams. If message persists, clear error message from internal memory. 2. Cycle VGD power off and on. Perform printer test. (NOTE: When handling printer, never lift printer by printer beak. If you adjust printer, you may need to realign printer beak with printer bezel.)
Printer Malfunction • Uneven type density	1. Bad ribbon cartridge. 2. Uneven from left to right: Maladjusted Platen Gap. 3. Uneven from top to bottom: Maladjusted Printhead Angle.	1. Replace cartridge. 2. Adjust Platen Gap. 3. Adjust Printhead Angle.
Printer Malfunction • Type is too light	1. Bad ribbon cartridge. 2. Maladjusted Platen Gap.	1. Replace cartridge. 2. Adjust Platen Gap.
Printer Malfunction • Ribbon tears • Printhead jams • Tickets smudge	Printhead angle is wrong for paper type you use.	Adjust Printhead Angle Lever.

Programmable Gate Array *(PGA)* Tilt Guide

Symptom	Probable Cause	Solutions
"XILINX PGA FAILURE" appears on display	PGA chip failure	Replace I/O Board chip XU41, or replace I/O Board.

Sound Guide

Symptom	Probable Cause	Solutions
No sound, but rest of slot machine operates	1. Bad or disconnected speaker cable 2. Missing or improperly positioned CPU Board Jumper JP2 3. Bad protection diode on I/O Board (Speaker may click when you turn on slot machine.) 4. Bad capacitor on I/O Board 5. Bad audio power amp on I/O Board (Unlikely)	1. Reconnect disconnected speaker cable. Repair or replace bad cable. 2. If CPU Board has 4-MB EPROMs, jumper pins 1 and 2. If CPU Board has 8-MB EPROMs, jumper pins 2 and 3. 3. Check for shorted D8 or D9. Replace bad part. 4. Check C53, C51 or C60. Replace bad part. 5. Check U35 (audio IC in large heatsink). Replace bad part.
Some sounds missing or distorted	Bad sound EPROM on CPU Board	1. Run Sound Tests in Administration Mode. 2. If one of these EPROMs is bad, replace it: XU17, XU18, XU30, XU31. (Some slot machines may not have all four chips.)
All sounds distorted	1. Bad -12V power supply 2. Bad protection diode on I/O Board 3. Bad capacitor on I/O Board 4. Bad audio power amp on I/O Board (Unlikely)	1. Check I/O Board -12V LED: If it's out, power supply may be bad. 2. Check for shorted D8 or D9. Replace bad part. 3. Check C57, C58 or C66. Replace bad part. 4. Check U35 (audio IC in large heatsink). Replace bad part. 5. Recheck the audio by running Sound Tests in Administration Mode.



Static RAM Tilt Guide

Symptom	Probable Cause	Solutions
"Battery Fail" appears on display	Failure of static RAM backup battery	1. Replace the battery. 2. Use the proper RAM Clear Chip to replace data lost due to the battery failure.
"Video Memory Heap Corrupt" on display.	Video memory error	Bad card or software error, change card.
"Insufficient Video Memory "	Video memory is full.	Verify you have 2M chip installed. If you do and symptom still exists, change board.
"Memory Cleared" appears on display. Top of candle flashes slowly.	You just cleared the static RAM.	Press DIAGNOSTIC button.
One of these messages appears on display...		Static RAM procedure: 1. Clear the static RAM. 2. Save gameplay, pricing and other location-programmed information to the central system (or write it down). 3. Shut off power, remove CPU Board and replace battery today. 4. Same symptoms repeat: Check backup battery voltage: Less than 3.6V? Replace battery and reclear static RAM. More than 3.6V? Check or replace MAX791 chip (WMS part 5880-13649-00). 5. Rerun startup tests. 6. If error messages still appear, the static RAM may be bad. Try replacing it and retest machine.
• "CRC Corrupt" • "Heap Corrupt" • "Heap Full" • "Deck Corrupt"	• OS data corrupt • Corrupt heap mem. area • Full heap mem area • Bad deck of cards	
• "Recoverable Game Log Data Corruption"	• Game Log Data is corrupt. Game will soft RAM clear and erase game log.	
• "RAM Signature Corruption"	• Critical RAM signature data is corrupt. Game must be RAM cleared.	
• "RAM Signature Corruption (Main and Aux)"	• Game Log Data is corrupt. Game will soft RAM clear and erase game log.	
• "Auxillary RAM Signature Corruption"	• Aux copy of RAM signature data is corrupt. Game will attempt to restore from Main copy.	
• "Main Meter Corruption"	• "Main Meter data copy corrupt. Game will try to restore from Aux copy.	
• "Main Meter Corruption (Data Lost)"	• "Critical Main Meter data is corrupt. Game must be RAM cleared.	
• "Unrecoverable Game Meter Corruption"	• "Unrecoverable Game Meter Corruption"	
• "Auxiliary Main Meter Corruption"	• Aux copy of Main Meter data is corrupt. Game will attempt to restore from Main copy.	
• "Jurisdictional Jumper Changed!"	• Jurisdictional Jumper has been changed; RAM clear the game.	
• "Illegal Denomination Set"	• Game denomination is incorrect or invalid; RAM clear the game.	
Top of candle flashes slowly.		

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

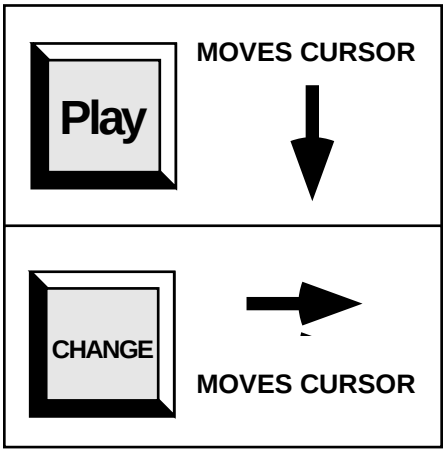
Dispose of used batteries according to the manufacturer's instructions.

Static RAM Tilt Guide, continued

Symptom	Probable Cause	Solutions
• "Configuration Data Corruption (Main and Aux)"	• Critical configuration data is corrupt. Game will attempt to restore from backup in Soft RAM Clear.	See Solutions column on preceeding table.
• "Configuration Data Corruption"	• Main copy of critical configuration data is corrupt. Game will attempt to restore from Aux copy.	
• "Auxilliary Configuration Data Corruption"	• Aux copy of critical configuration data is corrupt. Game will attempt to restore from Main copy.	
• "Operating System Data Corruption (Data Lost)"	• Critical system data is corrupt. Game must be RAM Cleared.	
• "Operating System Data Corruption"	• Main copy of critical system data is corrupt. Game will attempt to restore from Aux copy.	
• "Auxilliary Operating System Data Corruption"	• Aux copy of critical system data is corrupt. Game will attempt to restore from Main copy.	
• "Card Deck Data Corruption (Data Lost)"	• Card deck data is corrupt. Game must be RAM Cleared.	
• "Card Deck Data Corruption"	• Main copy of card deck data is corrupt. Game will attempt to restore from Aux copy.	
• "Auxilliary Card Deck Data Corruption"	• Aux copy of card deck data is corrupt. Game will attempt to restore from Main copy.	
• "Event Log Data Corruption (Data Lost)"	• Event log data is corrupt. Game will erase event log data in soft RAM clear.	
• "Event Log Data Corruption"	• Main copy of event log data is corrupt. Game will attempt to restore from Aux copy.	
• "Auxilliary Event Log Data Corruption"	• Aux copy of event log data is corrupt. Game will attempt to restore from Main copy.	
• "Touchscreen to Confirm Soft RAM Clear"	• Game memory corrupted and soft RAM clear required.	
• "Press Diag. Button to Exit Soft Ram Clear (Data Lost)"	• Soft RAM clear complete but data has been lost.	
• "Press Diag. Button to Exit Soft Ram Clear (Data Restored)"	• Soft RAM clear complete, data restored from backup storage.	
• "Keno Range Error"	• Keno specific game error (only occurs in Keno games)	
• "Invalid Card Value"	• Illegal card drawn (occurs in games that use card class)	
Top of candle flashes slowly.		

Touch Screen Tilt Guide

Symptom	Probable Cause	Solutions
• Touching screen results in no response or erroneous behavior • "No Touch Screen Response" appears on monitor screen	1. Improperly adjusted blind mating connector 2. Bad or loose Touch Screen interface cable 3. Bad or loose monitor/Touch Screen cable 4. Touch Screen is badly out of calibration 5. Bad Touch Screen Board 6. Bad Touch Screen 7. Locked up Touch Screen (You removed and replaced monitor with power on) 8. No power 9. Bad communication interface on I/O Board	1. Adjust connector for tight fit. 2. Loose interface cable: Reconnect it securely. Broken cable: Repair or replace it. 3. Loose monitor cable: Reconnect it securely. Broken cable: Repair or replace it. 4. Recalibrate Touch Screen: Press CHANGE button and simultaneously turn key switch. 5. Replace Touch Screen Board. 6. Replace monitor. 7. Turn VGD off and on. Then recalibrate Touch Screen. 8. Check for proper voltages on Touch Screen Board at P2: 1=+5V, 2=gnd, 3=–12V, 4=+12V Voltages are absent: Replace power cable. Voltages are present: Replace Touch Screen Board. 9. Replace I/O Board.
"Touch Screen Communications Fault" appears on monitor screen	1. Improperly adjusted blind mating connector 2. Bad or loose Touch Screen interface cable 3. Bad or loose monitor/Touch Screen cable 4. Bad Touch Screen Board 5. Bad communication interface on I/O Board	1. Adjust connector for tight fit. 2. Loose interface cable: Reconnect it securely. Broken cable: Repair or replace it. 3. Loose monitor cable: Reconnect it securely. Broken cable: Repair or replace it. 4. Replace Touch Screen Board. 5. Replace I/O Board.
Touch Screen won't calibrate or stay in calibration	1. Wet Touch Screen 2. Cracked Touch Screen 3. Bad monitor /Touch Screen cable 4. Bad Touch Screen interface cable 5. Bad Touch Screen Board 6. Bad communications interface on I/O Board	1. Dry it with hair dryer for five minutes. Don't clean it with ammonia-based cleaners. Use alcohol instead. 2. Replace monitor. 3. Repair or replace Touch Screen cable 4. Repair or replace interface cable. 5. Replace Touch Screen Board. 6. Replace I/O Board.



Touch Screen Fail? Use Player Panel Buttons

If the touch screen malfunctions, you can use two buttons to perform touch screen functions.

- **PLAY** (or DEAL/DRAW) moves the cursor downward. After the cursor reaches the screen's bottom edge, the cursor wraps around.

- **CHANGE** (or BET ONE) moves the cursor horizontally, toward your right. After the cursor reaches the right edge of the screen, the cursor wraps around.

To make a selection...

❑ 1. Turn the Attendant Key switch to enter Administration Mode.

❑ 2. Use PLAY and CHANGE (DEAL/DRAW and BET ONE) to move the cursor. Set the cursor atop the screen button that you want to select.

❑ 3. Simultaneously press both buttons to enter your selection.

Top Box Monopoly Board Communication Tilt Guide

Symptom	Probable Cause	Solutions
"NO TOP BOX RESPONSE!!"	Topbox not detected.	Check connection and reset.
"TOP BOX System Version Error"	Game requires a different OS (XU3) version in the topbox.	Check version and reset.
"TOP BOX XU10 Checksum Error"	Incorrect version (XU10).	Check version and reset.
"TOP BOX XU3 Checksum Error"	Incorrect version (XU3).	Check version and reset.
"TOP BOX XU4 Checksum Error"	Incorrect version (XU4).	Check version and reset.
"TOP BOX HEAP CORRUPT"	Memory is corrupt.	Reset the machine, if tilt continues, replace the topbox CPU board.
"TOP BOX OUT OF MEMORY"	Memory is corrupt.	Reset the machine, if tilt continues, replace the topbox CPU board.
"TOP BOX BAD PACKET"	Noise in communication.	Check cables and reset.
"TOP BOX DEBUG ERROR"	Internal topbox error.	Reset.
"TOP BOX BAD PACKET TYPE"	Incorrect game version or polling issue.	Check version and reset.
"TOP BOX BAD DIE SPECIFIED"	Dice not detected.	Check connections and reset.
"TOP BOX BAD LAMP INFO"	Incorrect lamp configuration.	Check version and reset.
"TOP BOX BUFFER OVERFLOW"	Internal VLT communication error.	Reset.
"TOP BOX DIE MECH FAILURE"	Dice not detected.	Check connections and reset.
"TOP BOX DIE STOP OUT OF RANGE"	Internal VLT communication error or software compatibility issue.	Check topbox and game versions and reset.

Top Box LCD Communication Tilt Guide

Symptom	Probable Cause	Solutions
LCD-box System Version Error	Game requires a different LCD OS (XU3) version in the topbox.	Check versions and reset.
LCD-box Image Version Error	Art ROMs (XU2, 4, 5) in topbox do not correspond to the bottom game.	Check versions and reset.
LCD-box Communication failed	Communication is failing.	Check versions and reset.
LCD-box CRC corrupt	Noise in communication.	Check cables and reset.
LCD-box heap corrupt	Video memory is corrupt.	Reset the machine, if tilt continues, replace the topbox CPU board.
LCD-box heap full	Full 'heap' memory area.	
LCD-box insufficient video-memory	Art ROMs (XU2, 4, 5) in topbox do not correspond to the bottom game.	Check versions and reset.
LCD-box VRAM Image too Big	Art ROMs (XU2, 4, 5) in topbox do not correspond to the bottom game.	Check versions and reset.
LCD-box VRAM Image not Loaded	Art ROMs (XU2, 4, 5) in topbox do not correspond to the bottom game.	Check versions and reset.
LCD-box Video Memory Heap Corruption	Video memory is corrupt.	Reset the machine, if tilt continues, replace the topbox CPU board.
LCD-box ROM Checksum Error	ROMs are corrupt.	Replace these ROMs.
LCD-box Image ROM and OS mismatch	Art ROMs (XU2, 4, 5) in topbox do not correspond to the bottom game.	Check versions and reset.
LCD-box Image ROM misplaced	One of the art ROMs (XU2, 4, 5) is placed in the wrong socket.	Check these ROMs and reset.
LCD-box received unknown packet-type	Art ROMs (XU2, 4, 5) in topbox do not correspond to the bottom game.	Check versions and reset.
LCD-box received corrupt packet	Noise in communication.	Check cables and reset.
LCD-box received unknown packet command	Game OS version not compatible with LCD OS version.	Check versions and reset.
LCD-box internal buffer overflow	Art ROMs (XU2, 4, 5) in topbox do not correspond to the bottom game.	Check versions and reset.

NOTICE

Reset by applying power cycle and/or performing a Hard RAM Clear

Outline and Table of Contents

The 5501 is based on the model 550 game, and simulates the play of a reel mech game. Because of the modification from the 550 model, the service and installation is identical except for the contents of this chapter.

Table of Contents

I. Outline and Table of Contents.....1

II. Hardware Changes.

A. Arm Mech.....2

B. 5-Button Panel.....3

C. Monitor/Glass Bezel.....3

III. Software Changes - Administration Mode

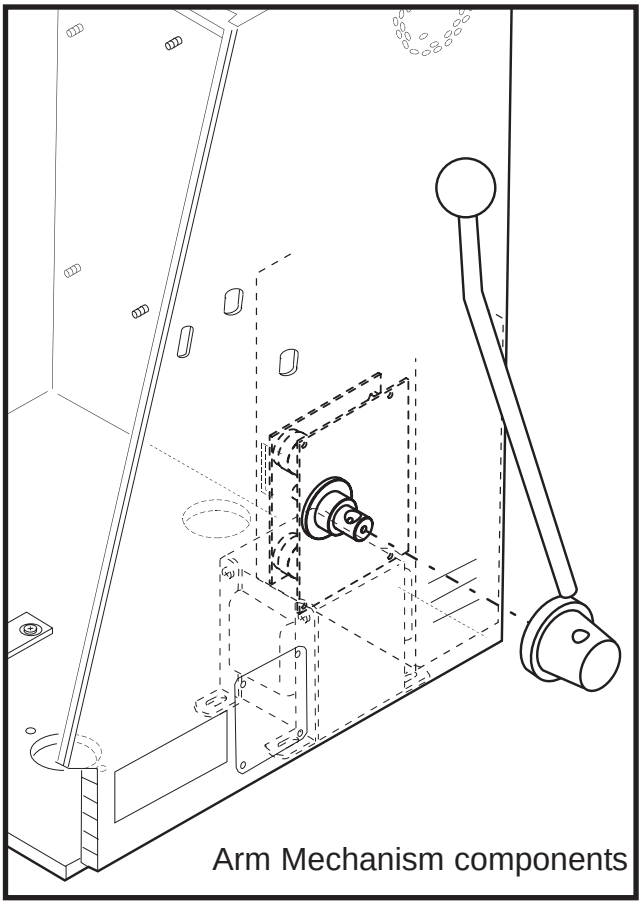
A. Attendant Menu.....4

1. Main Meters.....4

2. Auditing General.....5

3. History Logs.....5

Arm Mechanism



Arm Mechanism components

To simulate the operation of reel games, an Arm Mechanism is added to the side of the game. Note: Provide at least 6" of clearance between games for the Arm and Door movement.

This modification requires a special Cabinet with a hole in the side to accommodate the axle of the Arm Mech. Also, additional Pem Studs were installed to hang the mech on the wall. The mechanism hangs on the wall with four nuts, located in front of the PDU, over the transformer, and behind the Bill Validator respectively.

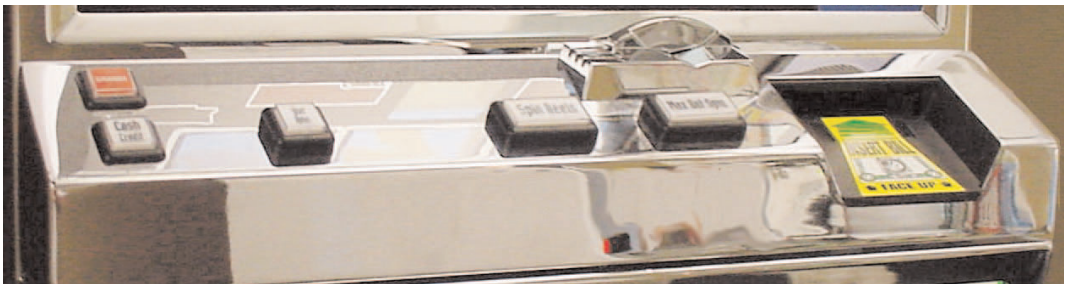
The single-bend Arm is inserted through the Hub Cover into the axle and secured with a long through-bolt from the inside. The ball comes installed on the end of the Arm.

The Arm Mech is connected to the 3 Reel Video Interface Harness which connects to the Backplane at the Topbox Socket. Also connected are the Meter Lamp, the printer, and the Top Box Interface Harness.

The Arm Mech function is supported by the game software. The arm's movement can be tested in the Administration Mode - Tests - I/O - Inputs which reads the Arm Up and Down position. Tests - I/O - Outputs - Arm Release will free the Arm Mechanism's solenoid and allow the arm to be pulled down.

5-Button Panel

The 5-Button Panel



The simplified 5-button Panel has only the basic buttons for uncomplicated play.

The change of the Button Panel affected the following in the Administration screens:

-There is no 2-4 button control of meter lamp.
-Input signals and Output button lamps have changed and are available in Tests - I/O - Inputs and Outputs.

Because the glass covers the Monitor/Touch Screen, the attendant menu is manipulated by the four white buttons on the panel. The BET button and the MAX BET SPIN button scrolls the highlight through the currently active menu. SPIN REELS selects the highlighted option. CASH/CREDIT moves the highlight up through the tree to higher level menus.

Monitor/Glass Bezel

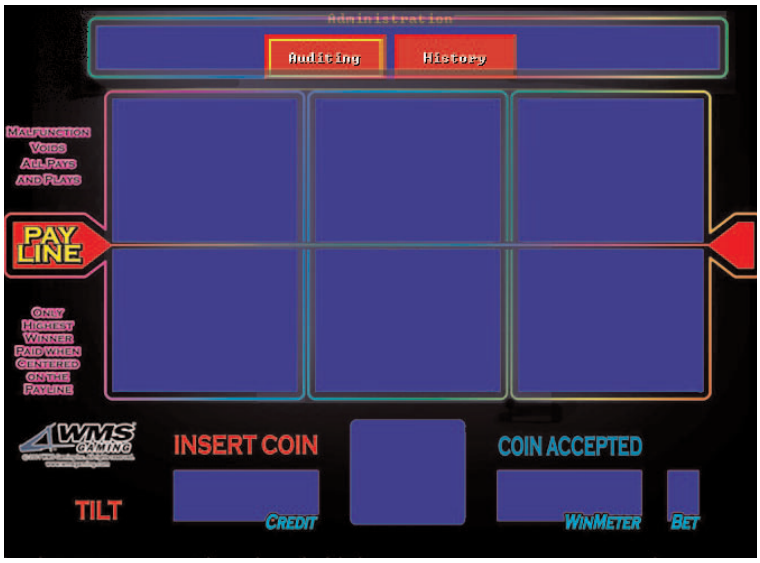
Art Glass covers the monitor for the appearance of actual reels behind the glass.

The clear windows of the Art Glass only allow limited portions of the monitor to be seen. This caused changes to the Attendant Menu System.

The glass covers the monitor so that the touch screen is only accessible when the door is open.

The Player Interface.

Attendant Menu System



The 3 Reel Video has a limited view of the Administration System. The Attendant's Menu has been changed to only include Auditing and History functions. The functions are the same, but the displays are reconfigured to fit in the available clear windows of the glass. Most of the changes are minor shifting. The few that are severely abbreviated will be clarified in the following pages.

Only two function categories are available behind the Art Glass.

Auditing - Main Meters

The Main Meter Screen behind the Art Glass.

Refer to the Administration Chapter titled *Auditing - Main Meters* for details of what each meter is reading.

The Main Meters screen has some of the highly compressed text. Listed are some of the equivelants:
SYSCTRL CRD = System Controlled Credits Now
BLS STACKER = Bills in Stacker
PLYD = Games Played Since
DRCLSD = Door Closed
NONCSHBL = Noncashable In

Auditing General

Refer to the Administration Chapter titled *Auditing* for details of what each meter is reading.

On each of the **Coin Meters** “Coin” has been removed to make space.

In the Host Bonus Meter Window, WAGER MTCH = Wager Match.

In the Tilts Meter Window:
RAM SIGN = RAM Signature Error
The rest of the meters are also counting Errors, typically CRC Errors.

The Theme Win Meters behind the Art Glass.

History - Logs

The History Logs were able to be viewed without abbreviating the text. The Use of the Logs is detailed in the Administration Chapter.

The Event Log behind the Art Glass.

Chapter 1. Parts, Electronic

NOTICE

Electronic component parts are contained in schematic manual A-005101 (System 1.5 Drawing Set).

• Boards, Circuit

Board, 17-in., Three-PCB Backplane A-000632-01
Board, Button Diode A-001815-00
Board, CPU and Video Daughter Card A-000051-31
(includes both CPU Board A-17677-03 and Video Card A-18402-33)
Board, CPU 1.5 .....A-17677-03
Board, CPU 1.5 Plus A-004275-03
Board, CPU 1.5 Plus, no EE A-004275-04
Board, Dotmation Plus Control A-003875-02**
Board, EPROM Extender A-003498-01
Board, Hex Opto *(coin-in optics w/cables).....* A-18097-01
Board, Hopper Control.....A-17118-02
Board, I/O A-18886-01
Board, Meter Driver A-002464-00
Board, RS232 to Current Loop, WBA BVD A-004307-02*
Board, RS485 Serial Communications.....A-17669-01
Board, Video Daughter Card (2-Meg VGA).....A-18402-33

NOTICE

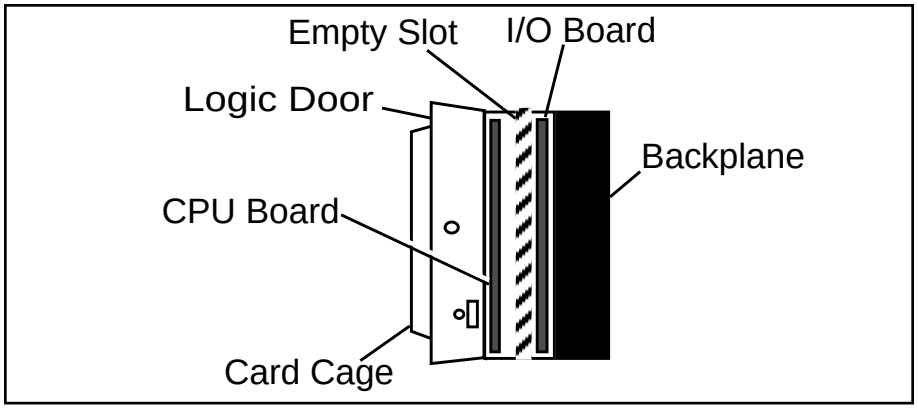
***If your game's bill validator has a JCM RS232 board, the replacement is WMS RS232 board A-004307-02. This board requires mounting bracket 01-005308.

NOTICE

****Used Only For Monopoly Top Box.**

• Cables

Cable, AC Extension, Top Box.....H-002340-01
Cable, AC Extension, Belly Lamp.....H-002343-00
Cable, Bally, Interface 5797-000993-00
Cable, Bill Validator/PDU/Backplane.....H-005564-00
Cable, Bridge Rectifier Assembly.....A-000881-00
Cable, CC-16 and IDX Coin Comparators.....5797-14014-00
Cable, CDS Interface.....5797-001800-00
Cable, Coin Comparator, Condor 5797-004090-00
Cable, Coin Validator/Chute H-003523-00
Cable, Coin Validator/Chute, Multi-Channel.....H-003590-00
Cable, Comm Intfc, Dual Host H-005746-01
Cable, DC Power, PDU/Backplane H-17965-00
Cable, Door and Lock Switch H-002335-00
Cable, Door Switch Extension H-004730-00
Cable, EDT, Interface H-003596-00
Cable, Fiber Optic Board 5797-13315-00
Cable, Hopper, Male BMI H-18096-00
Cable, Hopper Full Sense H-18095-00



Video Card Cage Components

NOTICE

Indented parts make up the parts that are above, and closer to the left margin. For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Parts Example

Item A
    Item B
        Item C

Electronic Parts

NOTICE

Indented parts make up the parts that are above, and closer to the left margin.

For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts

Item A
    Item B
        Item C

NOTICE

Electronic component parts are contained in schematic manual A-005101 (System 1.5 Drawing Set).

• Cables, *continued*

Cable, Hopper Interface Power H-002341-00
Cable, JCM WBA BV BMI Adapter *(10/11/20/21 Only)*.....5797-002337-00
Cable, JCM WBA BV Interface.....H-002333-00
Cable, Lamp, 18-Inch Fluorescent, 16" Topbox H-002339-00
Cable, Lamp, 18-Inch Fluorescent Belly.....H-002338-00
Cable, Meter Interface H-002334-00
Cable, Monitor, 17", PDU/CPU/Backplane.....5797-002475-00
Cable, PDU, AC Distribution Univ. H-19408-01
Cable, PDU, DC Power Univ. H-19409-01
Cable, PDU, IEC *(Earth Ground)*.....5797-14243-00
Cable, PDU, Power Supply/AC Outlet.....H-19407-01
Cable, PDU, Service Outlet Assy *(Nor. Amer.-110v)* H-19452-00
Cable, Player Panel, 2-Button H-003130-00
Cable, Player Panel, 3-Button H-003131-00
Cable, Player Panel, 5-Button *(Shielded*).....H-003320-01
Cable, Player Panel, 10-Button H-003522-01
Cable, Player Panel, 12-Button H-003433-01
Cable, Printer *(Dot Matrix Only)*, Serial, Ithaca 5797-002474-00
Cable, Speaker, Audio.....H-19429-01
Cable, Thermal Printer, Comm Power (Ithaca Only).....5797-005718-02
Cable, Topbox Tower Lamp H-002342-01
Cable, Umbilical Service, 24P 1:1, Monitor H-003445-00
Cable, Umbilical Service, Hopper.....5707-13694-00
Cord, Line 110V *(North America)* 5850-13344-00
Cord, Line, 250V *(North America)* 5850-000992-00
Cord, Line, 250V *(Continental Europe)* 5850-13272-00
Cord, Line, 250V *(British)* 5850-13273-00
Jumper, 1/2" Ground Braid, 8" Long.....5797-002377-00
Toroid, Line Cord, 2.4 Dia *(Used with line cord)*.....5556-005782-00

• Monitor

PController, t/s mt autobaudESD w/cse 5901-004956-01
Monitor, Kristel, 6-Cntrls, Complete with 17" Tch Scrn.....A-003910-01
Monitor, Wells, 6-Cntrls, Complete with 17" Tch Scrn.....A-003910-02
Monitor, Kristel, 6-Cntrls, w/Taped Tch Scrn.....A-003910-04
Monitor, Wells, 6-Cntrls, w/Taped Tch Scrn A-003910-05
Monitor, Tatung, 6-Cntrls, w/Taped Tch Scrn.....A-003910-07

• Parts-General, Replacement Electronic *(All Boards)*

BAG, SPARE PARTS

Bag, Spare Parts A-19460
    Bulb, #86, 6.3V/0.2A *(inside player panel btns)*.....24-8829
    Bulb, #555, 6.3V/250mA *(display)* 24-8768
    Bulb, #1888, 7V/500mA bayonet *(candle)* 24-8832
    Fuse, 4ASB, 250V 5731-06314-00

• Top Box, Monopoly

Ballast, Universal Input, 15W 5610-004995-00
Board, Dotmation Plus.....A-003875-02
Bulb, Fluorescent 15W, 18 24-8809
Cable, DC power Dot Plus T/B H-003966-00
Fan Assy, 115Vac 50/60hz.....A-004154
Fan Assy, 230Vac 50/60hz.....A-004592
Fan Assy, 24Vdc A-004134
Fuse, SB 2A 250V 5731-08665-00
Fuse, SB 4A 250V 5731-06314-00
Power Supply, 24V, 225W.....20-004115
Rope, 24V 1/2 dia clr 72 24-004127

NOTICE

Electronic component parts are contained in schematic manual A-005101 (System 1.5 Drawing Set).

• Top Box, LCD Style

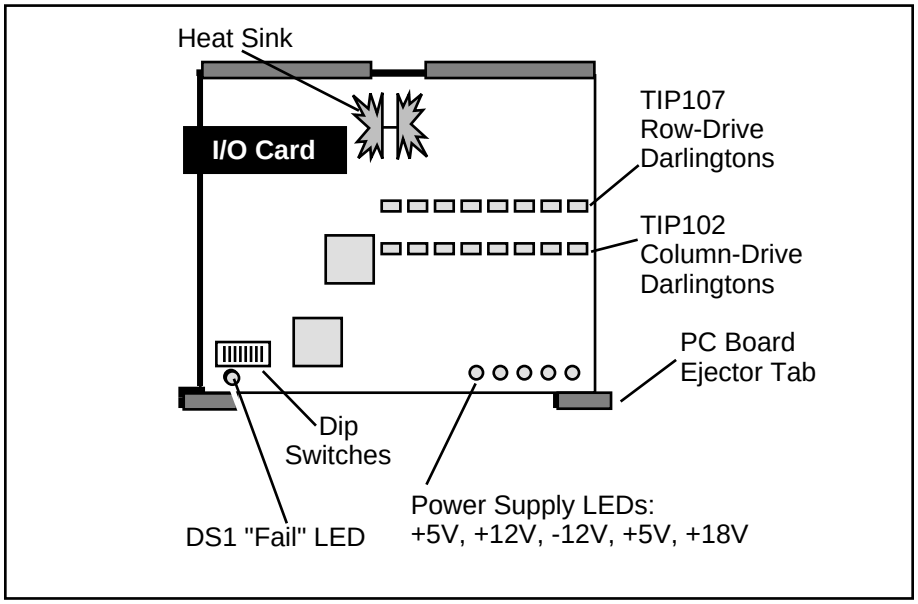
Ballast, Universal Input, 15W 5610-004995-00
Board, CPU 1.5 Plus A-004275-03
Bulb, Fluorescent 15W 18 24-8809
Fan Assy, 12V dc, 60x60x20.....A-005185-00
Fan Assy, 115V 50/60Hz A-004154
Lamp, Compact Fluorescent 9W, PLS 3500 24-002490-00
Monitor, LCD 15 Flat Panel 5901-004993-00
Power Supply, 110W, Triple Output 20-9965
Socket, Fluorescent Lamp.....20-9848
Socket, Lamp, PLS Style Bulb.....20-001677

• Unit, Power Distribution *(PDU)*

Board, +5/+18VDC, Linear Power Supply.....A-18938-03
Fuse, Triple Output PS, 5 x 20mm 4A FB 250V.....5730-005825-00
Supply, 110W, +5/±12VDC, Triple Output Pwr 20-9965
Supply, Monopoly Top Box power.....20-004115**

NOTICE

****Used Only For Monopoly Top Box.**



NOTICE

Electronic component parts are contained in schematic manual A-005101 (System 1.5 Drawing Set).

• Top Box, LCD Style, continued

PDU, EXCLUSIVE PARTS FOR NORTH AMERICAN, 110 VAC

PDU, 110V, NA, 16 pin.....A-002912-04
- Fuse, 4ASB, 250V 5731-06314-00
- Housing, PDU Sw/fuse/rcpt 01-003088-01
- Cable, Service Outlet.....H-19452-00
- Label, PDU 4A fuse 16-000070-02
- Label, PDU non-sw Rcptl.....16-000070-04
- Receptacle, Single Outlet 5851-13203-00

PDU, EXCLUSIVE PARTS FOR EUROPEAN (HUXLEY), 222 VAC

PDU, 222V, 50 Hz, 16 pin A-002912-05
- Fuse, 5 x 20mm-2A slow blow 5735-13853-00
- Housing, PDU Sw/fuse/rcpt, blank.....01-003088-07
- Knob, Panel-Type Fuse Holder, 5 x 20mm, ...5733-12869-01
- Label, PDU 2A fuse 16-000070-01

PDU, EXCLUSIVE PARTS FOR NA OR EUROPEAN, 222 VAC

PDU, Europe or N. Amer., 50/60 Hz, 16 pin A-002912-06
- Fuse, 2ASB, 250V 5731-08665-00
- Housing, PDU Sw/fuse/rcpt, blank.....01-003088-07
- Label, PDU 2A fuse 16-000070-01

Printed Circuit Board	Bar Top Video	Upright 17" Video	Upright 19" Video	Slant Top 19" Video	Slant Top Slot	Upright Slot
Backplane PCB, A-003622-00	✔					
Backplane PCB, A-000632-01		✔				
Backplane PCB, A-18905-03			✔	✔	✔	
Backplane PCB, A-17937-03						✔
CPU 1.5 PCB with 2MB Video Card, A-000051-31; includes...	✔	✔	✔	✔		
•CPU PCB, Sys 1.5, A-17677-03	✔	✔	✔	✔	✔	✔
•Daughter Card, 2MB Video, A-18402-33	✔	✔	✔	✔		
CPU PCB, Sys 1.5 Plus, A-004275-03 CPU PCB, Sys 1.5 Plus, A-004275-04	✔ ✔	✔ ✔	✔	✔ ✔		
Hopper Control PCB, A-17118-02	✔	✔		✔	✔	✔
I/O PCB, A-18886-01	✔	✔	✔	✔		
I/O PCB, A-17686-03					✔	✔
Lamp PCB, BV, A-19861-01				✔	✔	
Lamp PCB, BV, A-18088-01						✔
Lamp PCB, Payline, A-18087-00					✔	✔
Lamp PCB, Reel Display, A-17382-01					✔	✔
Meter Driver PCB, A-002464-00		✔				
Meter Driver PCB, A-17951-01	✔		✔	✔	✔	✔
Opto PCB, Hex, A-18097-01	✔	✔	✔	✔	✔	✔
Opto PCB, Quad, A-18097-00						✔
Power Distribution Unit PCB, A-18938-03 w/16 Pin Xfmr	✔	✔	✔	✔	✔	✔
Power Distribution Unit, PCB, A-18938-01 w/12 Pin Xfmr				✔	✔	✔
Reel Motor Control PCB, 20-002002					✔	✔

NOTICE

Many models of GDs employ the same CPU and I/O Boards. However, socketed EPROMS and PLDs on those boards are model or jurisdiction specific. You must install the appropriate EPROMS and PLDs before you can swap boards between models.

NOTICE

Canadian upright slots require a special bill validator general illumination cable, part number H-002132.

Notes

Chapter 2. Parts, Mechanical

• Cabinet

Cabinet-17" Upright, w/Wood Base A-005097-ZZZ

BILL VALIDATOR
WBA, Hsg, Assy w/Switches A-002981

PARTS, OTHER CABINET
Plate, No Coin, Cover, Bill Only.....01-003294-ZZZ
Plate, No Bill, Cover, Coin Only.....01-003293-ZZZ
Plate, No Top Box *(Various Colors)* 01-003373-ZZZ
Sleeve, 3/8-Inch Slit Hose RM-27-03*****
Wood, Cabinet Bottom 11-003535

• Cage, Card

Clamp, Richco Wslt 1/4" x 1/2" 03-002136

• Documents, Instruction

LABEL
Label, PDU 2A Fuse.....16-000070-01
Label, PDU 4A Fuse.....16-000070-02
Label, PDU Non-Switched Receptacle.....16-000070-04
Label, PDU Switched Receptacle.....16-000070-03
Label, Meter, Nomenclature *(Variable)*..... 16-003317-03
Label, Grounding.....16-002750
Label, On/Off Switch.....16-002749
Label, PDU Caution, Eng/Fr/Ger.....16-000070-05
Label, "Caution" Verify 115/230V 16-002040-00
Label, Battery Disclaimer.....16-002747
Label, Diagnostic Switch 16-002557
Label, Voltage Selection.....16-002748

MANUAL, GAMING SAFETY
Manual, Gaming Safety.....16-001796-01

MANUAL, VGD HANDBOOK
Manual, VGD, Pocket-Size Instruction 16-003492

MANUAL, CPU SYSTEM 1.5 VIDEO SCHEMATIC DRAWING
Manual, System 1.5 Video Schematic Dwg.....A-005101

MANUAL, MODEL 55X 17" VIDEO SERVICE
Manual, Model 55X Video Service A-005044

NOTICE

Indented parts make up parts that are above, and closer to the left margin.

For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts
Item A
  Item B
    Item C

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

NOTICE

***** Order these parts by length.

NOTICE

Indented parts make up parts that are above, and closer to the left margin.

For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts

Item A
    Item B
        Item C

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

• Hopper

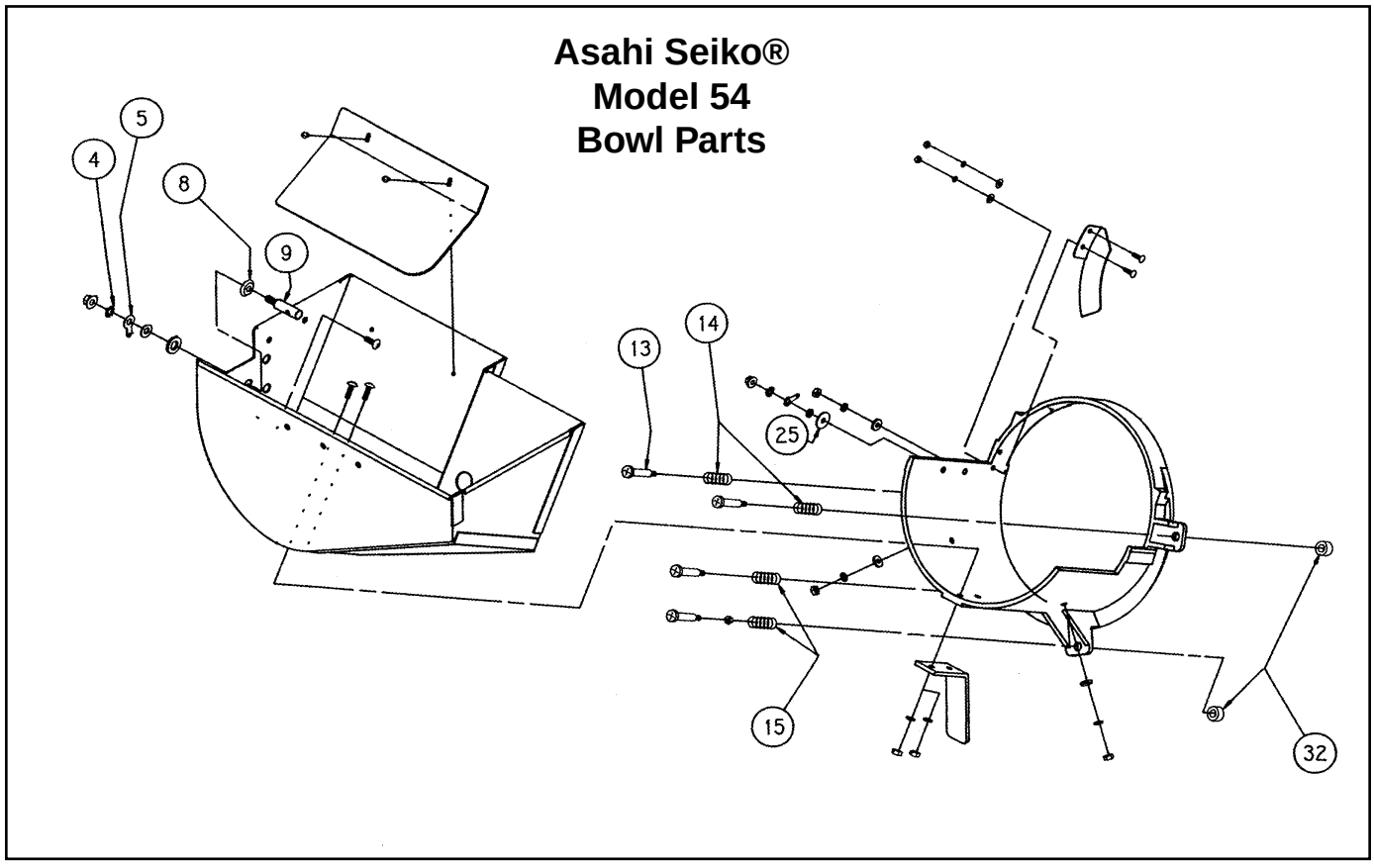
Bowl Kit, 2 Tier, Plastic 20-004480
Bowl Kit, Small Bowl A-005722

BOWL, ASAHI SEIKO USA® DH750, MODEL 54 SPARE PARTS

	Dwg Ref	Asahi Seiko #	WMS Gaming #
Collar, Mdl $1 Spcr, Bowl	32	DH7001M10T081	20-001064-52
Insulator, Nylon, Inner Bowl	8	DH7011M025152	20-001064-54
Nut, Shoulder m5	1	N5000SN99	20-001064-47
Pin, Outer Bowl Probe	9	DH7011M025153	20-001064-44
Screw, Bowl	13	DH7011M025047	20-001064-49
Spring, Lower Bowl Screw	15	DH7011M025049	20-001064-51
Spring, Upper Bowl Screw	14	DH7011M025048	20-001064-50
Terminal, Bowl Probe	5	DH7011M025093	20-001064-45
Washer, Bowl M5 Star	4	W5000SR99	20-001064-46
Washer, Flat 4X15X1.0	25	W4015FW10	20-001064-25
Washer, Nylon Out	2	011M025150	20-001064-55

HOPPER, ASAHI SEIKO USA® DH750, MODEL 54 SPARE PARTS

	Dwg Ref	Asahi Seiko #	WMS Gaming #
Armature with Stop	58	DH7001M025082	20-001064-37
Base, Snap-In Wire Tie			20-10008
Bearing with Retainer	43	DH7001M025402	20-001064-27
Bolt, M4 x 25SS,	32	B4025HXSS	20-001064-68
Boss, Plastic	26	DH7001M025026	20-001064-12



• Hopper, *continued*

Bowl, hpr-plstc-w/b9			20-001064-78
Bracket, Motor	56	DH7001M025079	20-001064-36
Bearing, Roller Lever	18	DH7001M025018	20-001064-07
Bolt, M4 x 12	21	B4012HX99	20-001064-73
Cover, Coin (5¢/25¢)	29	DH7001M025029	20-001064-16
Cover, Coin ($1 Token)	29	DH7001M10T029	20-001064-17
Cover, 5¢ & $1 Rbr Jump	50	DH7001M005072	20-001064-34
Cover, 25¢ & $1 Rbr Jump	50	DH7001M025072	20-001064-35
Disk, 5¢ Token	33	DH7001M005033	20-001064-18
Disk, 50¢ Token	33	DH7001M050074	20-001064-59
Disk, $1 Token	33	DH7001M10T033	20-001064-20
Disk, $1 Ontario Token	33		20-001064-80
Disk, 25¢ Token	33	DH7001M025033	20-001064-19
Guide, Coin, 5¢ + 25¢	28	DH7001M025028	20-001064-14
Guide, Coin, 50¢ Token	28	DH7001M050028	20-001064-57
Guide, Coin, $1	28	DH7001M100028	20-001064-15
Insulator, Hopper PCB			20-10036
Jump, 5¢ Rubber	49	DH7001M005071	20-001064-31
Jump, 25¢ Rubber	49	DH7001M025071	20-001064-32
Jump, $1 Rubber	49	DH7001M10T071	20-001064-33
Knife, Canada Loonie $1	25	DH7001M10T025	20-001064-61
Knife, 5¢	25	DH7001M005025	20-001064-09
Knife, 50¢ Token	25	DH7001M050025	20-001064-56
Knife, $1	25	DH7001M10T025	20-001064-11
Knife, 25¢	25	DH7001M025025	20-001064-10
Knife, One Rnd Token	25	DH7001M027025	20-001064-65
Lever, Motor Brake	59	DH7001M025083	20-001064-38
Lever, Pin Roller	17	DH7001M025017	20-001064-06
Lever, Roller, Steel	15	DH7001M025015	20-001064-04
Lever, Spring Roller	16	DH7001M025016	20-001064-05
Motor, w/Gearbox & Harnes	8	DH7001M025008	20-001064-02
Motor, w/Grbx, Harn.Conectr		DH7561P025008	20-004477-11
Nut, M4	20	N4000HX99	20-001064-79
Pin, Motor Drive	7	DH7001M025007	20-001064-01
Plate, Jump Rubber Adj	48	DH7001M025070	20-001064-30
Retainer, Separator $.50	63	DH7001M050074	20-001064-58
Ring, E-	19	W3000ERSS	20-001064-08
Screw, Bevel	27	DH7001M025027	20-001064-13
Screw, M3 x 4, w/SW,	31	S3004RHSW	20-001064-67
Screw, M4 x 8, IRG, Hard	39	S4008LH99	20-001064-26
Screw, M4 x 14, w/SW	30	S4014RHSW	20-001064-66
Screw, M4 x 25 SS Lrg Hd	47	S4025LHSS	20-001064-74
Screw, M4 x 12 Lrg Hd	47	S4012LH99	20-001064-75
Screw, M3 x 8 W/sw & Fw	53	S3008RHSF	20-001064-76
Separator, 5¢ & 25¢ Retainer	63	DH7001M020074	20-001064-42
Separator, $1 Token Retainer	63	DH7001M10T074	20-001064-43
Separator, Rubber Coin	62	DH7001M025073	20-001064-41

NOTICE

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Example Parts

Item A
    Item B
        Item C

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

• Hopper, *continued*

	Dwg Ref	Asahi Seiko #	WMS Gaming #
Sensor, Prox, & Connector	13	DH7001P025013	20-001064-03
Sensor, Prox, & Connector	13	DH7561P025013	20-001064-84
Shim, 4x8x0.2mm Hpr Knife	69	W4008FW02	20-001064-69
Shim, 4x8x0.3mm Hpr Knife	69	W4008FW03	20-001064-70
Shim, 4x8x0.5mm Hpr Knife	69	W4008FW05	20-001064-71
Shim, 4x8x0.8mm Hpr Knife	69	W4008FW08	20-001064-72
Spacer, Coin Gide (n/r on $1)	46	DH7001M025065	20-001064-29
Spring, Brake	60	DH7001M025084	20-001064-39
Spring, Cover Holder	36	DH7001M025036	20-001064-23
Spring, Cover Mounting	35	DH7001M025035	20-001064-22
Spring, Disc	37	DH7001M025037	20-001064-24
Spring, Stirring	34	DH7001M025034	20-001064-21
Standoff, PCB 3/16			20-9665-2
Stop, Brake .	61	DH7001M025082	20-001064-40
Washer, M4 x 15 x 1.0	38	W4015FW10	20-001064-25
Washer, Roller Lever	45	DH7001M025402	20-001064-28
Washer, M4 Spring	5	W4000SW99	20-001064-77

HOPPER, COMPLETE P & P, 17"

5¢ Coin	A-004398-01
25¢ Coin	A-004398-02
50¢ Coin	A-004398-03
$1 Token	A-004398-04
50¢ Token	A-004398-05
$1 Canadian	A-004398-06
1 Rand Token	A-004398-07
500L 5LL	A-004398-08
Emperyal	A-004398-09
50¢ Windsor Coin	A-004398-10
$1 Windsor Coin	A-004398-11
1 Rand Coin	A-004398-12
Sigma Token	A-004398-13
$2 Windsor Coin	A-004398-14
5¢ Canadian	A-004398-15
25¢ Canadian	A-004398-16
$2 Ontario IDX	A-004398-17
500 Lira	A-004398-18

NOTICE

The knife (25) should be adjusted to a distance of 0.2mm from the "pinwheel" (33), as measured by a feeler gauge.

NOTICE

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For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts

Item A
- Item B
  - Item C

NOTICE

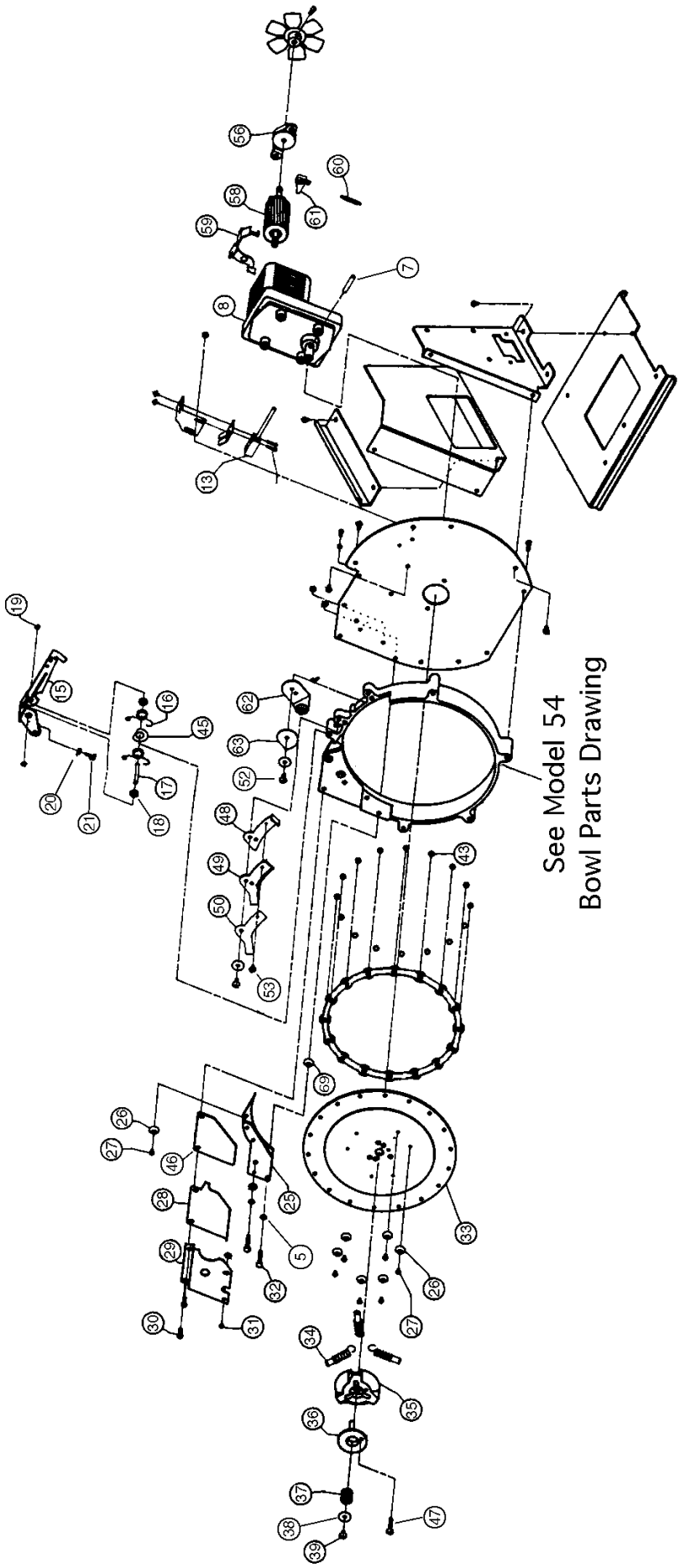
COMMON VS. SPECIFIC PARTS. Major items in this section include "common parts" and "denomination-specific parts." All coin mechanisms in this section employ the same common parts. But each coin mechanism requires different denomination-specific parts.

• Kits

COMPLETE 10-BUTTON PLAYER PANEL KIT

Kit, 10-Button Complete Player Panel 17U	A-003518-01-ZZZ
Link, Belly Door Loc 55C	01-002543
Bracket, Belly Door Loc Rel 55C	01-002882
Bar, Belly Door Loc 55C	01-003210
Panel, 10-Button CN/BV 55C	01-003262-10ZZZ
Cam, Flt 1.13 Dual Mtg	01-12793-01
Pin, Belly Door Loc Actr 55C	02-002544
Clamp, Cable 1/2"	03-7655-8
Spring, .028 x .25 x 1.37-26.5	10-002555

Asahi Seiko
Model 54
Hopper Parts



The knife (25) should be adjusted to a distance of 0.2mm from the "pinwheel" (33), as measured by a feeler gauge.

NOTICE

A-003518-02-ZZZ (not shown) is only used with 5 pay line, 25 coin games.
A-003518-03-ZZZ is only used with themes V012 and V023.
A-003518-04-ZZZ (not shown) is only used with 40 coin Rhode Island games.
A-003518-05-ZZZ (not shown) is only used for Pick 5 Poker.

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Example Parts

Item A
- Item B
  - Item C

NOTICE

P&P stands for "plug and play."

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

• Kits, *continued*

COMPLETE 12-BUTTON PLAYER PANEL KIT

Kit, 12-Button Complete Player Panel 17U A-003518-03-ZZZ
- Link, Belly Door Loc 55C 01-002543
- Bracket, Belly Door Loc Rel 55C 01-002882
- Bar, Belly Door Loc 55C 01-003210
- Panel, 12-Button CN/BV 55C.....01-003262-10ZZZ
- Cam, Flt 1.13 Dual Mtg 01-12793-01
- Pin, Belly Door Loc Actr 55C 02-002544
- Clamp, Cable 1/2" 03-7655-8
- Spring, .028 x .25 x 1.37-26.5.....10-002555

COIN CONVERSION KIT ($.05)

Kit, $.05 Conversion 17U.....A-002996-01
- Tce, Back, 50C, $.05 .....21-002576-01ZZZ
- Plate, Tce Alignment 50C, $.05 01-002738-01
- Insert, $.05 Denomination.....31-003298-01
- Kit, Asahi Seiko $.05 Conv. A-000700

COIN CONVERSION KIT ($.10)

Kit, $.10 Token Conversion 17U.....A-002996-02
- Tce, Back, 50C, 500 LL 21-002576-13ZZZ
- Plate, Tce Alignment 50C, 500LL 01-002738-11
- Insert, $.10 Denomination.....31-003298-08
- Kit, Asahi Seiko $.10 Tkn Conv. A-004284

• Lamp, Top Box, Fluorescent

LAMP, TOPBOX, 5" ASSEMBLY

Lamp, U/M EA 5" T/B 55C.....A-003101
- Ballast, 15W 120V 50/60 Hz 5610-14210-00
- Bracket, Lamp 5" T/B 55C 01-003838
- Bulb, Fluorescent 15W, 18" 24-8809
- Socket, Fluorescent Lamp 20-9848
- Socket, Starter 20-9849
- Starter, 4-22W w/Condenser 20-002780

LAMP, TOPBOX, 9" & 16" ASSEMBLY

Lamp, U/M EA 9" T/B & 16" T/B, 55C A-002591
- Ballast, 15W 120V 50/60 Hz 5610-14210-00
- Bracket, Lamp Mtg 9"&16" T/B, 55C.....01-004043
- Bulb, Fluorescent 15W, 18" 24-8809
- Socket, Fluorescent Lamp 20-9848
- Socket, Starter 20-9849
- Starter, 4-22W w/Condenser 20-002780

Lamp, TOPBOX, 16" ROUND TOP

Lamp, 16" Round Top T/B 55C A-003699
- Ballast, 15W 120V 50/60 Hz 5610-14210-00
- Bracket, Lamp 16" Rnd T/B 55C.....01-003646
- Bulb, Fluorescent 15W, 18" 24-8809
- Socket, Fluorescent Lamp 20-9848
- Socket, Starter 20-9849
- Starter, 4-22W w/Condenser 20-002780

• Lamp, Tower *(Candle)*

BULB

Bulb, #1888, 7V/500mA *(Bayonet)*.....24-8832

FILTER, BRASS-FINISH, TWO-TIER, SHORT

Filter, Tower Lamp, Blue and White, Short, Brass 20-000846-11
Filter, Tower Lamp, Blue and Yellow, Short, Brass.....20-000846-26
Filter, Tower Lamp, Green and White, Short, Brass.....20-000846-14
Filter, Tower Lamp, Orange and White, Short, Brass.....20-000846-15
Filter, Tower Lamp, Red and White, Short, Brass.....20-000846-12
Filter, Tower Lamp, Red and Yellow, Short, Brass.....20-000846-22
Filter, Tower Lamp, White and Blue, Short, Brass 20-000846-16
Filter, Tower Lamp, White and Green, Short, Brass.....20-000846-19
Filter, Tower Lamp, White and Orange, Short, Brass.....20-000846-10
Filter, Tower Lamp, White and Red, Short, Brass.....20-000846-17
Filter, Tower Lamp, White and Yellow, Short, Brass.....20-000846-18
Filter, Tower Lamp, Yellow and Red, Short, Brass.....20-000846-21
Filter, Tower Lamp, Yellow and White, Short, Brass.....20-000846-13

FILTER, BRASS-FINISH, TWO-TIER, TALL

Filter, Tower Lamp, Blue and White, Tall, Brass 20-10057-11
Filter, Tower Lamp, Blue and Yellow, Tall, Brass.....20-10057-26
Filter, Tower Lamp, Green and White, Tall, Brass 20-10057-14
Filter, Tower Lamp, Orange and White, Tall, Brass 20-10057-15
Filter, Tower Lamp, Red and White, Tall, Brass.....20-10057-12
Filter, Tower Lamp, Red and Yellow, Tall, Brass 20-10057-22
Filter, Tower Lamp, White and Blue, Tall, Brass 20-10057-16
Filter, Tower Lamp, White and Green, Tall, Brass 20-10057-19
Filter, Tower Lamp, White and Orange, Tall, Brass 20-10057-10
Filter, Tower Lamp, White and Red, Tall, Brass.....20-10057-17
Filter, Tower Lamp, White and Yellow, Tall, Brass.....20-10057-18
Filter, Tower Lamp, Yellow and Red, Tall, Brass 20-10057-21
Filter, Tower Lamp, Yellow and White, Tall, Brass.....20-10057-13

FILTER, CHROME-FINISH, TWO-TIER, SHORT

Filter, Tower Lamp, Blue and White, Short, Chrome.....20-000846-01
Filter, Tower Lamp, Blue and Yellow, Short, Chrome 20-000846-25
Filter, Tower Lamp, Green and White, Short, Chrome.....20-000846-04
Filter, Tower Lamp, Orange and White, Short, Chrome....20-000846-05
Filter, Tower Lamp, Red and White, Short, Chrome 20-000846-02
Filter, Tower Lamp, Red and Yellow, Short, Chrome.....20-000846-24
Filter, Tower Lamp, White and Blue, Short, Chrome.....20-000846-06
Filter, Tower Lamp, White and Green, Short, Chrome.....20-000846-09
Filter, Tower Lamp, White and Orange, Short, Chrome....20-000846-10
Filter, Tower Lamp, White and Red, Short, Chrome 20-000846-07
Filter, Tower Lamp, White and Yellow, Short, Chrome 20-000846-08
Filter, Tower Lamp, Yellow and Red, Short, Chrome.....20-000846-23
Filter, Tower Lamp, Yellow and White, Short, Chrome 20-000846-03

FILTER, CHROME-FINISH, TWO-TIER, TALL

Filter, Tower Lamp, Blue and White, Tall, Chrome.....20-10057-01
Filter, Tower Lamp, Blue and Yellow, Tall, Chrome 20-10057-25
Filter, Tower Lamp, Green and White, Tall, Chrome.....20-10057-04
Filter, Tower Lamp, Orange and White, Tall, Chrome.....20-10057-05

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Example Parts

Item A
    Item B
        Item C

NOTICE

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Example Parts

Item A
    Item B
        Item C

NOTICE

COMMON VS. SPECIFIC PARTS. Major items in this section include "common parts" and "coin-specific parts." All hoppers in this section employ the same common parts. But each hopper requires different coin-specific parts.

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

• Lamp, Tower *(Candle)*, continued

Filter, Tower Lamp, Red and White, Tall, Chrome 20-10057-02
Filter, Tower Lamp, Red and Yellow, Tall, Chrome.....20-10057-24
Filter, Tower Lamp, White and Blue, Tall, Chrome.....20-10057-06
Filter, Tower Lamp, White and Green, Tall, Chrome.....20-10057-09
Filter, Tower Lamp, White and Orange, Tall, Chrome.....20-10057-10
Filter, Tower Lamp, White and Red, Tall, Chrome 20-10057-07
Filter, Tower Lamp, White and Yellow, Tall, Chrome 20-10057-08
Filter, Tower Lamp, Yellow and Red, Tall, Chrome.....20-10057-23
Filter, Tower Lamp, Yellow and White, Tall, Chrome 20-10057-03

TOWER, TWO TIER

Lamp, Tall Clear and Clr, Brass Tower, Two-Tier 20-005220-10
Lamp, Tall Clear and Clr, Chrome Tower, Two-Tier.....20-005220-20
Lamp, Short Clr and Clr, Brass Twr, Two-Tier 20-005219-10
Lamp, Short Clr and Clr, Chrome Twr, Two-Tier.....20-005219-20

TOWER, FOUR TIER

Twr Lt, 4 Tier Wht/Grn/Yel/Yel.....20-003945-01
Twr Lt, 4 Tier Wht/Grn/Yel/Blu.....20-003945-02
Twr Lt, 4 Tier Wht/Grn/Yel/Yel.....20-003945-03
Twr Lt, 4 Tier Wht/Grn/Yel/Blu.....20-003945-04
Twr Lt, 4 Shrt Wht/Grn/Yel/Yel 20-004145-01
Twr Lt, 4 Shrt Wht/Grn/Yel/Blu 20-004145-02

• Locks and Cams

Cam, Flat, 1.13-Inch (28.7mm), Dual Mtg *(Bill Access Door, Bill Door, Card Cage, Chassis, Hopper, Printer)*.....01-12793-01
Cam, WBA Cash Cassette 20-003504-45
Lock, No-Key Shipping 20-001608
Switch, Momentary Lock *(Reset Switch)*.....20-10059

SPECIFICATIONS FOR STANDARD SHIPPING LOCKS IN INCHES

Dimensions, Cam Mounting Hole: Diameter 0.280 x 0.220"

Door	Barrel Length	Double D Hole Size	Rotation to Unlock
Belly	5/8"	0.755 x 0.635"	CW or CCW
BV Cashbox	5/8"	0.760 x 0.635"	CW or CCW
Cassette	5/8" or 1-1/8	0.760 x 0.635"	LH hole CW
Logic	5/8"	0.760 x 0.635"	CW or CCW
Main	5/8"	0.755 x 0.635"	CCW

Lock/Switch	Barrel Length	Double D Hole Size	Rotation to Unlock
NJ Extra Stacker Lk.	5/8"	0.760 x 0.635"	CW or CCW
NJ Extra Cass. Lk.	5/8" or 1-1/8	0.760 x 0.640"	RH hole CCW
Jackpot Key Sw.	< 2.5"	0.760 x 0.680"	N/A

• Locks and Cams, continued

SPECIFICATIONS FOR STANDARD SHIPPING LOCKS IN mm
Dimensions, Cam Mounting Hole: Diameter 7.1 x 5.6 mm

Door	Barrel Length	Double D Hole Size	Rotation to Unlock
Belly	15.9 mm	19.2 x 16.1 mm	CW or CCW
BV Cashbox	15.9 mm	19.3 x 16.1 mm	CW or CC
Cassette	15.9* mm	19.3 x 16.1 mm	LH hole CW
Logic	15.9 mm	19.3 x 16.1 mm	CW or CCW
Main	15.9 mm	19.2 x 16.1 mm	CCW

Lock/Switch	Barrel Length	Double D Hole Size	Rotation to Unlock
NJ Extra Stacker Lk.	15.9 mm	19.3 x 16.1 mm	CW or CCW
NJ Extra Cass. Lk.	15.9* mm	19.3 x 16.2 mm	RH hole CW
Jackpot Key Sw.	< 63.5 mm	19.3 x 17.3 mm	N/A

* Or 28.6 mm

• Monitor

17" MONITOR
Bracket, Monitor Upper Tie.....01-002806
Mounting Frame, Monitor 01-002801
Kit, Touch Screen Replacement (taped) A-005815
Sensor, 17 Microtouch.....5470-004817-01

• Printer, Components

ITHACA PRINTER 70 SERIES
Base, Printer 55L.....01-003510
Bracket, Printer Shipping 55L.....01-003546
Bracket, Printer Slide 55L.....01-003509
Bracket, Printer Stop 55L 01-003545
Bracket, Printer Exit Barrier 55L.....01-003547
Clamp, Cable 1/2" 03-7655-8
Paper, Journal 20-9703
Printer, Ithaca, Rewind-Rear Con.....20-003744-03
Printer, Ithaca, w/o Rewind-Rear Con 20-003745-03

ITHACA PRINTER, THERMAL 700 SERIES
Bracket, Therm Printer Mtg 01-005733
Bracket, Printer Power Mtg.....01-005880
Cord, Line 110V (N.A.) 5850-13344-00
Cover, Dr Btm None-55C 01-003544-01
Endcap, Cn Tray, LH 55c 21-002879-02ZZZ
Endcap, Cn Tray, RH 55c.....21-002879-01ZZZ
Panel, Barrier.....01-005735
Paper, Printer Ithaca Therm 700 Ser 62x120.....20-005862-01
Paper, Printer Ithaca Therm 700 Ser 65x120.....20-005862-02
Paper, Printer Ithaca Therm 700 Ser 65x156.....20-005862-03
Printer, Thermal, 750 62x120mm.....20-005786-01
Printer, Thermal 750 65x120mm.....20-005786-02
Printer, Thermal 750 65x156mm.....20-005786-03

NOTICE

Indented parts make up parts that are above, and closer to the left margin.

For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts
Item A
    Item B
        Item C

NOTICE

COMMON VS. SPECIFIC PARTS. Major items in this section include "common parts" and "coin-specific parts." All hoppers in this section employ the same common parts. But each hopper requires different coin-specific parts.

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

NOTICE

***** Order these parts by length.

NOTICE

Indented parts make up parts that are above, and closer to the left margin.

For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts

Item A
    Item B
        Item C

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

NOTICE

Additional 20-002449-ZZZ pushbutton assembly part numbers are available through your Regional Field Service Office.

• Printer, Components, continued

Plate, Bezel 01-005734-P01
Plate, Cpnl, Cvr-n/CN-55C 01-003294-ZZZ
Power supply, 24Vdc 60W, POWDEC 5765-006085-00
Printer, Ithaca Series 700 20-005786
Tray, No Coin 01-005732

• Pushbuttons, Player Panel

PUSHBUTTON ASSEMBLIES

M/rect 6.3V, HOLD/Cancel 20-002564-01
Sq 6.3V, a Dinero/Credit.....20-002449-49
Sq 6.3V, a Trocar Dinero.....20-002449-48
Bet 1/Bust 20-002449-44
Sq 6.3V, Jogar, 1 Por Lin 20-002449-55
Sq 6.3V Jogar, 2 Por Lin 20-002449-56
Sq 6.3V Jogar, 3 Por Lin 20-002449-57
Sq 6.3V Jogar, 4 Por Lin 20-002449-58
Sq 6.3V Jogar, Aposta Max.....20-002449-59
Sq 6.3V Lamp, A 1 Line.....20-002449-32
Sq 6.3V Lamp, A 2 Lines.....20-002449-33
Sq 6.3V Lamp, A 3 Lines.....20-002449-34
Sq 6.3V Lamp, A 4 Lines.....20-002449-35
Sq 6.3V Lamp, A Play 1 Per.....20-002449-37
Sq 6.3V Lamp, A Play 2 Per.....20-002449-38
Sq 6.3V Lamp, A Play 3 Per.....20-002449-39
Sq 6.3V Lamp, A Play 4 Per.....20-002449-40
Sq 6.3V Lamp, A Play 5 Per.....20-002449-41
Sq 6.3V Lamp, A Play 7 Per.....20-002449-42
Sq 6.3V Lamp, A Play 9 Per.....20-002449-43
Sq 6.3V Lamp, a 1 Linha.....20-002449-50
Sq 6.3V Lamp, a 2 Linhas 20-002449-51
Sq 6.3V Lamp, a 3 Linhas 20-002449-52
Sq 6.3V Lamp, a 4 Linhas 20-002449-53
Sq 6.3V Lamp, a 5 Linhas 20-002449-54
Sq 6.3V Lamp, a 7 Lines 20-002449-63
Sq 6.3V Lamp, a 9 Lines 20-002449-64
Sq 6.3V Lamp, a Play 10p.....20-002449-60
Sq 6.3V Lamp, a Play 18p.....20-002449-61
Sq 6.3V Lamp, B Bet One 20-002449-18
Sq 6.3V Lamp, BET ONE.....20-002449-02
Sq 6.3V Lamp, B Collect 20-002449-22
Sq 6.3V Lamp, CALL ATT 20-002449-10
Sq 6.3V Lamp, CASH/CREDIT 20-002449-07
Sq 6.3V Lamp, CHANGE (Red) 20-002449-14
Sq 6.3V Lamp, CLCT WN'GS 20-002449-12
Sq 6.3V Lamp, DEAL/DRAW 20-002449-09
Sq 6.3V Lamp, MAX BET 20-002449-01
Sq 6.3V Lamp, SERVICE.....20-002449-65

PUSHBUTTON COMPONENTS

Bezel Assy, Sq w/plngr & spring.....20-001986-01
Insert, Square 1 Linha 20-001985-55

• Pushbuttons, Player Panel, continued

Insert, Square 2 Linhas 20-001986-56
Insert, Square 3 Linhas 20-001986-57
Insert, Square 4 Linhas 20-001986-58
Insert, Square 5 Linhas 20-001986-59
Insert, Square 1 Line 20-001986-22
Insert, Square 2 Line 20-001986-23
Insert, Square 3 Lines 20-001986-24
Insert, Square 4 Lines 20-001986-25
Insert, Square 5 Lines 20-001986-26
Insert, Square 7 Lines 20-001986-68
Insert, Square 9 Lines 20-001986-69
Insert, Square Bet/Stand 20-001986-11
Insert, Square Bet Two.....20-001986-34
Insert, Square Cash Out.....20-001986-17
Insert, Square Change, Red/Wht Text 20-001986-20
Insert, Square Change, Wht/Blk.....20-001986-19
Insert, Square Collect.....20-001986-14
Insert, Square Collect Winnings 20-001986-18
Insert, Square Deal.....20-001986-15
Insert, Square Deal/Draw 20-001986-16
Insert, Square Double Down 20-001986-12
Insert, Square Max Bet.....20-001986-10
Insert, Square Quick Pick.....20-001986-13
Insert, Square Service Red/Wht Text.....20-001986-21
Insert, Square Play 1 Per Line.....20-001986-27
Insert, Square Play 2 Per Line.....20-001986-28
Insert, Square Play 3 Per Line.....20-001986-29
Insert, Square Play 4 Per Line.....20-001986-30
Insert, Square Play 5 Per Line.....20-001986-31
Insert, Square Play 7 Per Line.....20-001986-32
Insert, Square Play 9 Per Line.....20-001986-33
Insert, M Rect B Bet One Credit.....20-001986-94
Insert, M Rect B Bet Pre Line.....20-001986-97
Insert, M Rect B Deal 20-001986-93
Insert, M Rect B Double Down 20-001986-95
Insert, M Rect B Erase 20-001986-88
Insert, M Rect B Hold Cancel 20-001986-86
Insert, M Rect B Max Bet.....20-001986-91
Insert, M Rect B Max Bet Spin 20-001986-87
Insert, M Rect B Play 5 Credits 20-001986-92
Insert, M Rect B Select Lines 20-001986-96
Insert, M Rect B Spin Reels 20-001986-90
Insert, M Rect B Start 20-001986-89
Insert, M Rect Bet One Credit 20-001986-41
Insert, M Rect Bet Per Line 20-001986-47
Insert, M Rect Deal.....20-001986-40
Insert, M Rect Deal/Draw 20-001986-44
Insert, M Rect Deal/Draw/Rebet.....20-001986-45
Insert, M Rect Double Down.....20-001986-42
Insert, M Rect Erase.....20-001986-36
Insert, M Rect Hold Cancel.....20-001986-35
Insert, M Rect Max Bet.....20-001986-38
Insert, M Rect Play 5 Credits.....20-001986-39

NOTICE

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Example Parts
Item A
    Item B
        Item C

NOTICE

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NOTICE

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Example Parts

Item A
    Item B
        Item C

NOTICE

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NOTICE

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• Pushbuttons, Player Panel, continued

Insert, M Rect Play 20-001986-43
Insert, M Rect Select Lines.....20-001986-46
Insert, M Rect Start.....20-001986-37
Insert, M Rect Blank 20-001986-49
Insert, Square Bet 1/Bust 20-001986-50
Insert, Square Blank.....20-001986-48
Insert, Square Deal/Hit 20-001986-52
Insert, Square Dinheiro/Credito 20-001986-54
Insert, Square Call Attendant Wht.....20-001986-70
Insert, Square Hold Cancel 20-001986-67
Insert, Square Jogar 1 Por Linha.....20-001986-60
Insert, Square Jogar 2 Por Linha.....20-001986-61
Insert, Square Jogar 3 Por Linha.....20-001986-62
Insert, Square Jogar 4 Por Linha.....20-001986-63
Insert, Square Jogar Aposta Maxim 20-001986-64
Insert, Square Max Bet/Stand 20-001986-51
Insert, Square Play 10 Per Line.....20-001986-65
Insert, Square Play 18 Per Line.....20-001986-66
Insert, Square Trocar Dineiro 20-001986-53
Insert, Square B Bet One 20-001986-72
Insert, Square B Bet/Stand.....20-001986-73
Insert, Square B Call Attendant.....20-001986-80
Insert, Square B Cash/Credit.....20-001986-77
Insert, Square B Cash Out 20-001986-81
Insert, Square B Change.....20-001986-83
Insert, Square B Change Red/Wht.....20-001986-84
Insert, Square B Collect.....20-001986-76
Insert, Square B Collect Winning.....20-001986-82
Insert, Square B Deal 20-001986-78
Insert, Square B Deal/Draw.....20-001986-79
Insert, Square B Double Down 20-001986-74
Insert, Square B Max Bet 20-001986-71
Insert, Square B Quick Pick.....20-001986-75
Insert, Square B Service.....20-001986-85
Label, Sq Red w/CALL-ATTN VLT 20-001986-09
Label, Sq Wht w/BET-ONE VLT.....20-001986-05
Label, Sq Wht w/CASH-CREDIT VLT 20-001986-06
Lens, Sq Clear Btn VLT.....20-001986-03

• Readers, Card *(Option)*

PANEL, BLANK CARD READER
Plate, Blank Card-Reader Mounting.....01-003145-00P06

READER, CARD, ACRES BE2, 3X4 KEYPAD
Plate, Crdr Acres BE2.....01-003145-17ZZZ
Gutter, Acres BE2.....03-004612
Rivet, Snap-Richco SR-2632.....20-10011-01

• Reader, Card, continued

READER, CARD, ACRES BE2, 2X6 KEYPAD
Plate, Crdr, Acres BE2 2x6 Keypad 01-003145-24ZZZ
Gutter, Acres BE2.....03-005837

READER, CARD, ACRE® LEGACY
Plate, Acre Card-Reader Mounting, Rec 01-03145-01ZZZ
Spacer, 7/16" 03-6047-9

READER, CARD, ACRES BE2, REDUCED HEIGHT TB
Plate, Crdr, Acres BE2 .....01-005070-15ZZZ
Plate, Crdr, Acres BE2, 2x6 keypad 01-005070-18ZZZ

READER, CARD ACSC/SMS®
Assy, Ground ACSC Card-Reader A-003529
Bracket, ACSC Interface Mounting.....01-003917
Plate, ACSC Card-Reader Mounting, Rectangular 01-003145-05ZZZ
Spacer, 3/8".....03-6047-2

READER, CARD, CDS®, MAGNETIC AND OPTICAL
Bar, CDS Keypad Mtg 01-003865
Plate, CDS, Card-Reader Mounting 01-003145-02ZZZ
Spacer, 3/8".....03-6047-2

READER, CARD, CDS®, VFD® MAGNETIC
Plate, CDS VFD Card-Reader Mounting 01-003145-13ZZZ
Spacer, 5/16".....03-6047-4

READER, CARD, CDS®, VFD® OPTICAL
Cover, CDS VFD 01-004131
Plate, CDS VFD Card-Reader Mounting 01-003145-14ZZZ
Spacer, 5/16".....03-6047-4

READER, CARD, EDT®, 5MM MAGNETIC
Plate, EDT 5mm, Card-Reader Mounting.....01-003145-03ZZZ
Spacer, 3/8".....03-6047-2

READER, CARD, EDT®, 5MM OPTICAL
Plate, EDT 5mm, Card-Reader Mounting.....01-003145-03ZZZ
Plate, EDT Optical Card-Reader 01-002244-ZZZ
Spacer, 3/8".....03-6047-2

READER, CARD, EDT®, 9MM MAGNETIC
Plate, EDT 9mm, Card-Reader Mounting.....01-003145-04ZZZ
Spacer, 3/8".....03-6047-2

READER, CARD, EDT®, 9MM OPTICAL
Plate, EDT 9mm, Card-Reader Mounting.....01-003145-04ZZZ
Plate, EDT Optical Card-Reader 01-002244-ZZZ
Spacer, 3/8".....03-6047-2

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Example Parts
Item A
    Item B
        Item C

NOTICE

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NOTICE

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Example Parts

Item A
    Item B
        Item C

NOTICE

***** Order these parts by length.

• Reader, Card *(Option)*

READER, CARD, GSI
Plate, GSI Crdr 01-003145-18ZZZ

READER, CARD, GRIPS CRYSTAL
Plate, Grips Crystal Crdr.....01-003145-22ZZZ

READER, CARD, GRIPPS®, RECTANGULAR
Plate, Gripps, Rectangular Card-Reader Mounting.....01-003145-06ZZZ
Terminal, 25" Quick Fit 5826-000643-00

READER, CARD, IGS, 5" VFD DSPL
Plate, Card Reader IGS VFD 01-003145-15ZZZ
Plate, IGS Keypad Cover 01-004305-ZZZ

READER, CARD, IVERSON
Plate, Iverson Card-Reader Mounting 01-003145-16ZZZ
Spacer, 5/16" 03-6047-4

READER, CARD, MGM GRAND
Plate, Crdr MGM.....01-003145-21ZZZ

READER, CARD, MIKOHN®
Plate, Mikohn Card-Reader Mounting 01-003145-07ZZZ
Spacer, 7/16" 03-6047-9

READER, CARD, PARADIGM
Plate, Crdr, Paradigm 01-003145-23ZZZ
Gutter, Acres BE2.....03-005837

READER, CARD SDS®, EPI®
Plate, SDS, EPI Card-Reader Mounting.....01-003145-12ZZZ

READER, CARD, SDS®, RECTANGULAR KEYPAD
Plate, SDS Card-Reader Mounting 01-003145-08ZZZ
Spacer, 5/16" 03-6047-4

READER, CARD, SDS®, SASY®, SQUARE KEYPAD
Plate, SDS, SASY Card-Reader Mounting.....01-003145-09ZZZ
Spacer, 5/16" 03-6047-4
Gutter, SDS, SASY.....03-003427
Rivet, Snap-Richco SR-2632.....20-10011-01

• Topbox *(Complete Replacement Assemblies)*

TOPBOX, 5" ASSEMBLY, W/O CARD READER
Topbox, 5" w/o Crd Rdr *(e.g.; Blk, Almond)...* 01-003567-01ZZZ
Bracket, Glass Mtg, mat Blk 01-002908-P06
Bracket, 5" w/o Crd Rdr, t/b.....01-002918-D07

• Topbox, *continued*

Cover, Tower Light t/b 01-002118-ZZZ
Crown, 5" w/o Crd Rdr.....01-004484-01ZZZ
Foam, 1" x 3" 20-002886
Lamp, Assy, Fluorescent, t/b A-003101
Plate, Crd Rdr.....01-003145-ZZP06
Reflector, Lamp 5" t/b.....01-003039

TOPBOX, 5" ASSEMBLY, WITH CARD READER
Topbox, 5" w/Crd Rdr *(e.g.; Blk, Almond)*..... .....01-003567-02ZZZ
Bracket, 5" w/Crd Rdr, LH-55C 01-002919-01D07
Bracket, 5" w/Crd Rdr, RH-55C.....01-002919-02D07
Cover, Tower Light t/b 01-002118-ZZZ
Crown, 5" w/Crd Rdr.....01-004484-02ZZZ
Foam, 1" x 3" 20-002886
Lamp, Assy,Fluorescent, t/b A-003101
Plate, Crd Rdr.....01-003145-ZZP06
Reflector, Lamp 5" t/b.....01-003039

TOPBOX, 9" ASSEMBLY, W/O CARD READER
Topbox, 9" w/o Crd Rdr *(e.g.; Blk, Almond)*... .....01-003568-01ZZZ
Bracket, 9" w/o Dot/Crd Rdr, LH-55x.....01-004331-01D07
Bracket, 9" w/o Dot/Crd Rdr, RH-55x 01-004331-02D07
Bracket, Glass Mtg 01-002908-P06
Cover, Twr Lt t/b 01-002118-ZZZ
Crown, 9" w/o Crd Rdr.....01-004484-03ZZZ
Foam, 1" x 3" 20-002886
Lamp, Assy, Fluorescent, t/b A-002591
Plate, Crd Rdr.....01-003145-ZZP06

TOPBOX, 9" ASSEMBLY, WITH CARD READER
Topbox, 9" w/Crd Rdr *(e.g.; Blk, Almond)*..... .....01-003568-02ZZZ
Bracket, 9" w/Crd Rdr, LH-55x 01-004332-01D07
Bracket, 9" w/Crd Rdr, RH-55x.....01-004332-02D07
Cover, Twr Lt t/b 01-002118-ZZZ
Crown, 9" w/Crd Rdr.....01-004484-04ZZZ
Foam, 1" x 3" 20-002886
Lamp, Assy, Fluorescent, t/b A-002591
Plate, Crd Rdr.....01-003145-ZZP06

TOPBOX, 16" FLAT TOP ASSEMBLY, W/O CARD READER
Topbox, 16" Assy w/o Crdr*(e.g.; Blk Wrnkl)* 01-003449-01ZZZ
Bracket, t/b 16" w/o Dot/Crdr, RH-55x.....01-004333-01D07
Bracket, t/b 16" w/o Dot/Crdr, LH-55x 01-004333-02D07
Bracket, Glass mtg 01-002908-ZZZ
Crown, 16" w/o Crd Rdr.....01-004483-01ZZZ
Foam, 1" x 3" 20-002886
Lamp, Assy, Fluorescent, t/b A-002591
Pedestal, Twr Lt t/b 16" 03-003454-ZZZZZ
Plate, Crd Rdr.....01-003145-ZZP06

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For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts
Item A
    Item B
        Item C

NOTICE

***** Order these parts by length.

NOTICE

On round top assemblies, D04 crowns are used on D01 games.

NOTICE

Indented parts make up parts that are above, and closer to the left margin.

For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

Example Parts

Item A
  Item B
    Item C

NOTICE

***** Order these parts by length.

NOTICE

On round top assemblies, D04 crowns are used on D01 games.

NOTICE

09-004782-ZZ is a family group of BVD part numbers. P/Ns -00 to -15 have an RS232 board installed. Part numbers -16 and higher do not have an RS232 board installed.

If a JCM RS232 board has to be replaced, use RS232 board A-004307-02 and required mounting bracket 01-005308.

• Topbox, *continued*

TOPBOX, 16" FLAT TOP ASSEMBLY, WITH CARD READER

Topbox, 16" "Big" w/Crd Rdr *(e.g.; Blk Wrnkl)*.....01-003449-02ZZZ
Bracket, t/b 16"-w/o Dot, Lh Crd Rdr.....01-004334-02D07
Bracket, t/b 16"-gls stp, Rh Crd Rdr.....01-004334-01D07
Crown, 16" w/Crd Rdr.....01-004483-02ZZZ
Foam, 1" x 3".....20-002886
Lamp, Assy, Fluorescent, t/b.....A-002591
Pedestal, Twr Lt t/b 16".....03-003454-ZZZZZ
Plate, Crd Rdr.....01-003145-ZZP06

TOPBOX, 16" ROUND ASSEMBLY, W/O CARD READER & DOT

Topbox, 16" Round w/Crd Rdr *(e.g.; Blk Wrnkl)*.....01-003858-01ZZZ
Bracket, t/b 16"w/o Crdr & dot Lh Crd Rdr.....01-004303-01
Bracket, t/b 16"-gls crn, Rh Crd Rdr.....01-004303-02
Clip, 16" Round-55C.....01-003686
Crown Round Top.....01-003644-01ZZZ
Lamp, Assy, Fluorescent, t/b.....A-003699
Pedestal, Twr Lt t/b 16" Round.....03-003454-ZZZZZ
Plate, Crd Rdr.....01-003145-ZZP06

TOPBOX, 16" ROUND ASSEMBLY, WITH CARD READER

Topbox, 16" Round w/Crd Rdr *(e.g.; Blk Wrnkl)*.....01-003858-02ZZZ
Bracket, t/b 16" w/o Dot Mtg Lh Crd Rdr.....01-004335-01D07
Bracket, t/b 16"w/o dot Mtg, Rh Crd Rdr.....01-004335-02D07
Clip, 16" Round-55C.....01-003686
Crown Round Top.....01-003644-02ZZZ
Lamp, Assy, Fluorescent, t/b.....A-003699
Pedestal, Twr Lt t/b 16" Round.....03-003454-ZZZZZ
Plate, Crd Rdr.....01-003145-ZZP06

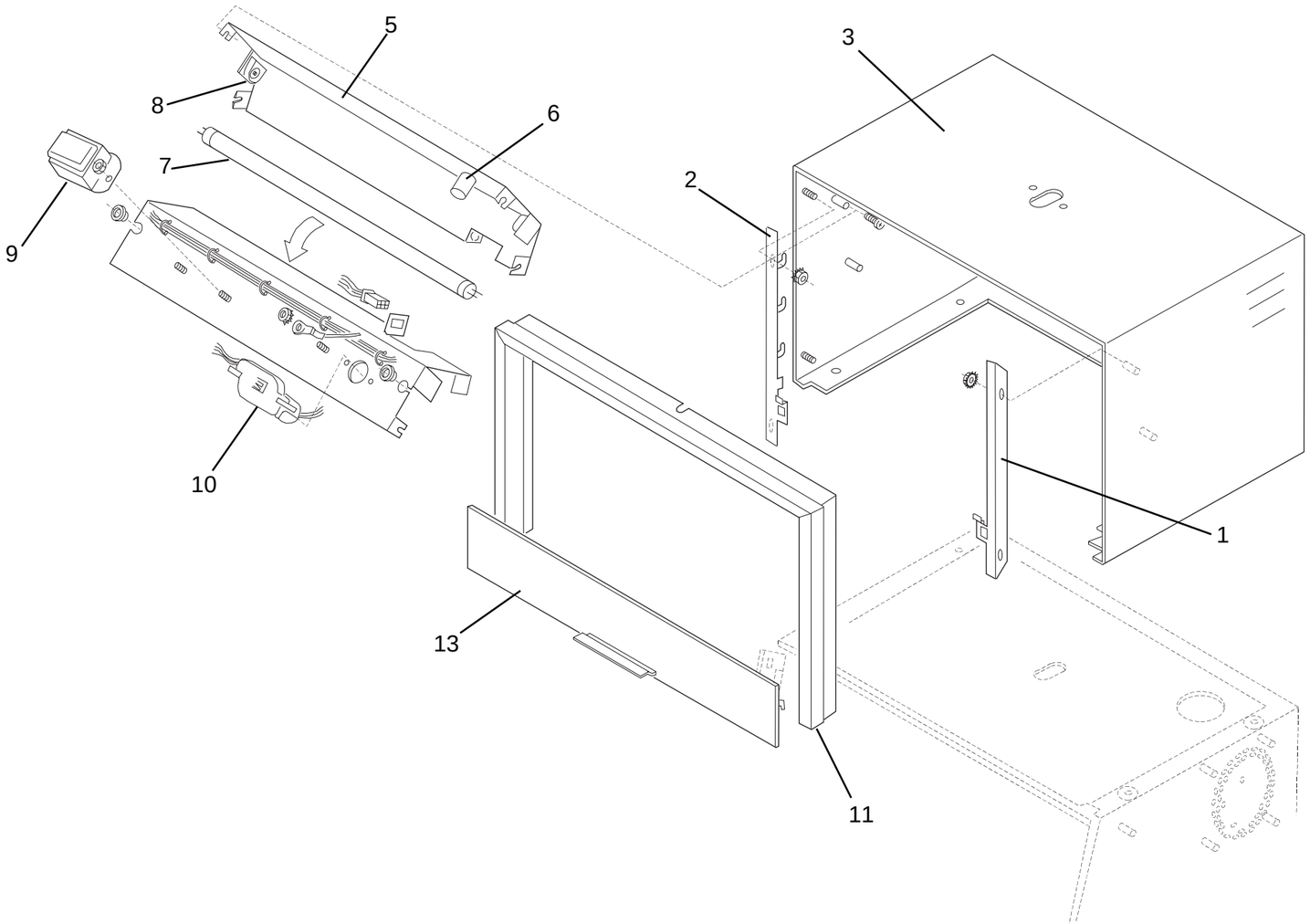
• Validators, Bill (WBA) and Bezels

Bezel, WBA 66mm Blk 2/LED, US.....A-003026-01
Bezel, WBA 66mm Yel 2/LED, US.....A-003026-02
Bezel, WBA 71mm Blk 2/LED, Can, Slvk.....A-003026-03
Bezel, WBA 71mm Yel 2/LED, Can, Slvk.....A-003026-04
Bezel, WBA 77mm Blk 2/LED.....A-003026-05
Bezel, WBA 77mm Yel 2/LED.....A-003026-06
Bezel, WBA 81mm Blk 2/LED.....A-003026-07
Bezel, WBA 81mm Yel 2/LED.....A-003026-08
Holder, Cash CST, WBA 55C.....20-002575
Tape, 3/8" x 1/8" SS.....RM 22-27*****
WBA, USA 10-ss-1m-flash.....09-004782-00
WBA, USA 11-ss-1m-eprom.....09-004782-01
WBA, USA 12-ss-4m-flash.....09-004782-02
WBA, USA 13-ss-4m-eprom.....09-004782-03
WBA, Canada 20-ss-1m-flash.....09-004782-04

• Validator, Bill (WBA), continued

WBA, Canada 21-ss-1m-eprom 09-004782-05
WBA, Canada 22-ss-4m-flash 09-004782-06
WBA, Canada 23-ss-4m-eprom 09-004782-07
WBA, Svk 20-ss-1m-flash.....09-004782-08
WBA, Svk 21-ss-1m-eprom 09-004782-09
WBA, Svk-21-ss-1m-eprom.....09-004782-10
WBA, ita-21-ss-1m-eprom 09-004782-11
WBA, grb-20-ss-1m-flash 09-004782-12
WBA,: grb-21-ss-1m-eprom.....09-004782-13
WBA, brz-20-ss-1m-flash 09-004782-14
WBA, brz-21-ss-1m-eprom.....09-004782-15
WBA,: usa-10-ss-1m-f-no RS-232.....09-004782-16
WBA, usa-11-ss-1m-e-no RS-232.....09-004782-17
WBA, usa-12-ss-4m-f-no RS-232.....09-004782-18
WBA, usa-13-ss--4m-e-no RS-232.....09-004782-19
WBA, can-20-ss-1m-f-no RS-232.....09-004782-20
WBA, can-21-ss-1m-3-no RS-232.....09-004782-21
WBA, can-22-ss-4m-f-no RS-232.....09-004782-22
WBA, can-23-ss-4m-e-no RS-232.....09-004782-23
WBA, svk-20-ss-1m-f-no RS-232 09-004782-24
WBA, svk-21-ss--1m-e-no RS-232 09-004782-25
WBA, ita-20-ss-1m-f-no RS-232.....09-004782-26
WBA, ita-21-ss-1m-e-no RS-232.....09-004782-27
WBA, grb-20-ss-1m-f-no RS-232 09-004782-28
WBA, grb-21-ss-1m-e-no RS-232 09-004782-29
WBA,: brz-20-ss-1m-f-no RS-232.....09-004782-30
WBA, brz-21-ss-1m-e-no RS-232.....09-004782-31
WBA, zaf-22-ss-4m-f-no RS-232.....09-004782-32
WBA, zaf-23-ss-4m-e-no RS-232.....09-004782-33
WBA, col-20-ss-1m-f-no RS-232 09-004782-34
WBA, col-21-ss-1m-e-no RS-232 09-004782-35

Chapter 3. Large Exploded Views



Topbox

• Topbox

	Dwg Ref	WMS Gaming #
Ballast, 15W 120V 50/60Hz	9	5610-14210-00
Bracket, 9" T/B w/Crd Rdr-R, w/o Dot Matr	1	01-004332-02D07
Bracket, 9" T/B w/Crd Rdr-L, w/o Dot Matr	2	01-004332-01D07
Bracket, Lamp Mtg, T/B 9 or 16"	5	01-004043
Bulb, Fluorescent 15W 18"	7	24-8809
Crown, 9" w/o Crd Rdr	11	01-002915-03ZZZ
Crown, 9" w/Crd Rdr	11	01-002915-04ZZZ
Plate, Crd Rdr	13	01-003145-ZZP06
Socket, Fluorescent Lamp	8	20-9848
Socket, Starter	10	20-9849
Starter, 4-22 w/Condenser	6	20-002780
Topbox, 9" w/Crd Rdr	3	01-002783-02ZZZ
Topbox, 9" w/o Crd Rdr	3	01-002783-01ZZZ

NOTICE

Indented parts make up parts that are above, and closer to the left margin.

For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn't include any other parts. Order Item A to obtain Items B and C.

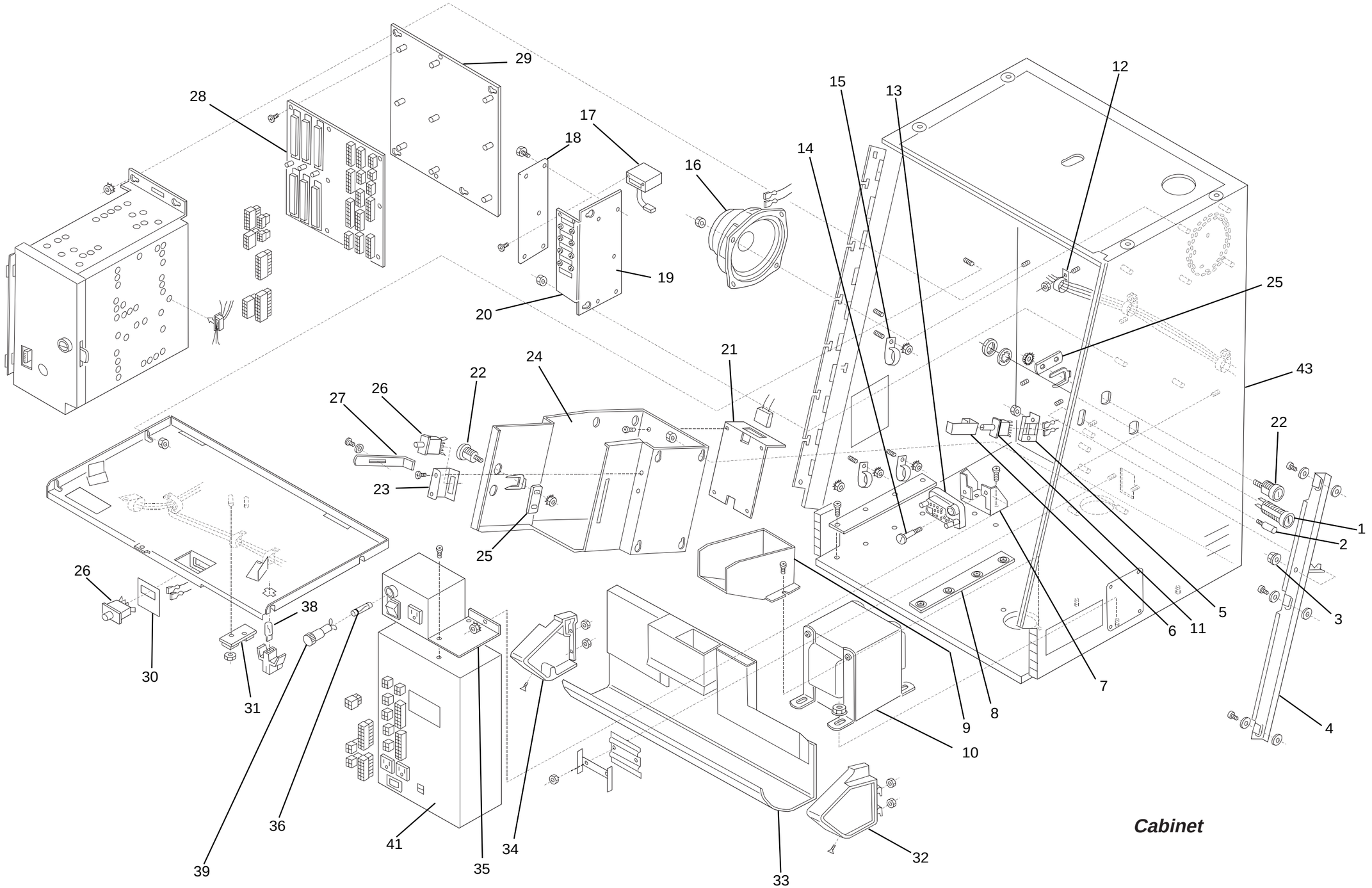
Example Parts

Item A
    Item B
        Item C

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part number and color.

Large Exploded Views



Cabinet

• Cabinet

	Dwg Ref	WMS Gaming #
Bar, Main Door Locking	4	01-004252
Bracket, Door Switch Activator	6	01-002870
Bracket, Hopper B/Mate	7	01-002550
Bracket, Door Sw Mtg	5	01-003325
Bracket, Meter Mtg	19	01-002807
Bracket, WBA-Door Sw-Actr	27	01-002949
Bracket, WBA-Door Sw-Mtg	23	01-002549
Bulb, #555, 6.3V, .25A	38	24-8768
Cabinet, 55x	43	01-003519-ZZZ
Cam, Flt 1.13 Dual Mtg	25	01-12793-01
Chute, Coin Xfer	9	03-004479
Clamp, Cable, 1”	12	03-7655-16
Clamp, Cable, 0.812, Metal	15	20-003565
Connector, Plug Housing, 25-Pos	13	5792-13539-00
Cover, WBA/Conn Mtg	21	01-005308
Endcap, Coin Tray-LH	34	21-002879-02ZZZ
Endcap, Coin Tray-RH	32	21-002879-01ZZZ
Fuse, 5x20mm, 2A Slow Blow	36	5735-13853-00
Fuse, 4A 250V Slow Blow	36	5731-06314-00
Fuse, 2A 250V, Slow Blow	36	5731-08665-00
Guide, Hopper Base w/b	8	01-002376
Holder, Fuse, Knob, 5mm x 20mm	39	5733-12869-01
Holder, Fuse, Panel	39	5733-12869-00
Housing, WBA-Door Switch Mtg	24	01-003185
Label, Diagnostic/Pwr	30	16-003570
Label, Meter Nomenclature	20	16-003317-03
Lock, Shipping, No Key	22	20-001608
Meter, Electromechanical	17	20-9951
Nut, 1/4-20 Flangrip	3	4420-01141-00
Panel, No Tray	33	01-003860
PCB, 3x2 E Meter Driver	18	A-002464-00
PCB, 17” Backplane	28	A-000632-01
PCB, Button Diode	31	A-001815-00
PDU, 110V NA, 16 pin	41	A-002912-04
PDU, 222V NA/EURO, 16 pin	41	A-002912-06
PDU, 222V HUX, 16 pin	41	A-002912-05
PDU, Housing, SW/FS/RCT N Amer, 110V	35	01-003088-01
PDU, Housing, SW/FS/RCT Blank, 220V	35	01-003088-07
Pin, Lock Bar Drive	2	02-002359
Plate, Backplane, 3 PCB	29	01-002466
Screw, 6-32x16 shl st zn	14	4006-01162-16
Speaker, 8 Ohm Full Range, 5-1/4, 25W	16	5555-13961-00
Switch, Lock, .25 Term Momentary, Reset	1	20-10059
Switch, Momentary DPDT, Interlock	26	5643-14246-00
Switch, Interlock, 3 Position, Gold	11	5643-13204-00
Transfmr, Int’l, 16-pin, Main Pwr (w/cables)	10	A-002509-00
Tray, Hopper	33	01-003819
Tray, Printer	33	01-003540

NOTICE

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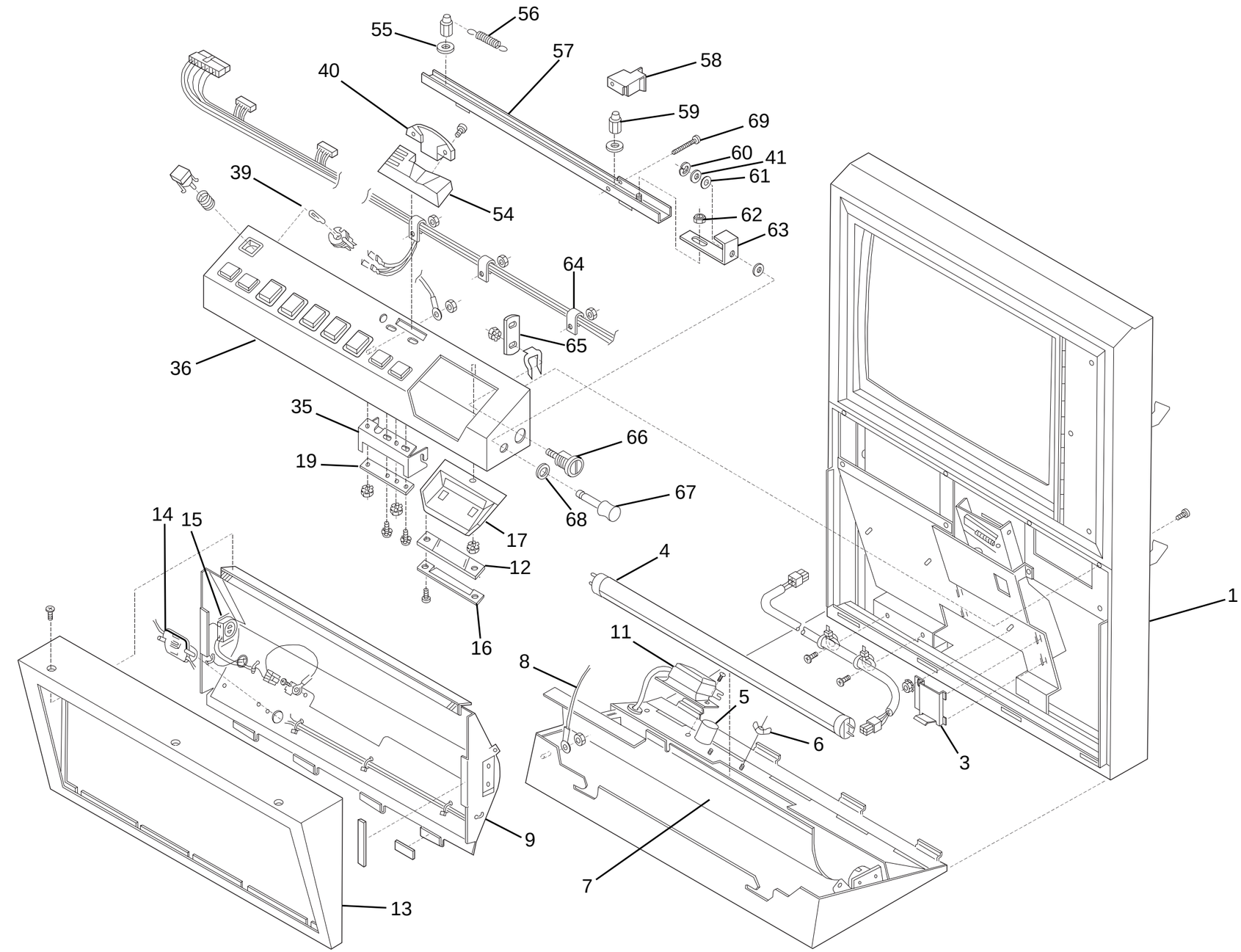
For instance, in the example below, Item A includes both Item B and Item C. Item B includes Item C, but not Item A. Item C doesn’t include any other parts. Order Item A to obtain Items B and C.

Example Parts

Item A
- Item B
  - Item C

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part



Door, Main-Front

• Door, Main-Front

	Dwg Ref	WMS Gaming #
Ballast, 15W 120V 50/60Hz	11	5610-14210-00
Bar, Belly Door-IOC	57	01-003210
Bearing, Nyliner	68	20-8790
Bezel, Button Panel WBA	17	01-003940-P06
Bracket, Belly Door Loc Rel	58	01-002882
Bracket, Brer Pnl-Stop	3	01-003909
Bracket, Coin Comparator Mtg 50c	35	01-002739
Bulb, Fluorescent 15W 18"	4	24-8809
Bulb, #86 6.3V, 0.2A	39	24-8829
Cable, Door Stop .06" x 15.15"	8	20-002884
Cam, Flt 1.13 Dual Mtg	65	01-12793-01
Clamp, Cable 1/2"	64	03-7655-8
Cover, Bulb Lamp Tray	7	01-003235
Door, Belly Lamp	13	01-002876-ZZZ
Door, Main 55c (1997)	1	01-002877-ZZZ
Door, Main 55c (1998)	1	01-003542-ZZZ
E Ring, .250S Shaft Dia	60	20-8712-25
Lens, WBA LED	12	03-003228
Link, Belly Door Loc 50c	63	01-002543
Lock, No Key-Shipping	66	20-001608
Nut, 8-32 esn/ntm	62	4408-01119-01
Nut, Belly Door-1 Bar-Rtnt	59	02-002883
Nut, 8-32 Wing	6	4408-01120-00
Panel, 03 Button Coin/BV (Not Shown)	36	01-003262-03ZZZ
Panel, 05 Button Coin/BV (Not Shown)	36	01-003262-05ZZZ
Panel, 06 Button Coin/BV (Not Shown)	36	01-003262-06ZZZ
Panel, 10 Button Coin/BV	36	01-003262-10ZZZ
Panel, 12 Button (Not Shown)	36	01-003262-12ZZZ
Pin, Belly Door Loc Actr 50c	67	02-002544
Plate, Cpnl Cvr-n/bv 55c	17	01-003293-ZZZ
Plate, TCE Alignment 50c, .05 Coin/Token	19	01-002738-01
Plate, TCE Alignment 50c, .25 Coin/Token	19	01-002738-02
Plate, TCE Alignment 50c, .50 Coin/Token	19	01-002738-03
Plate, TCE Alignment 50c, $1 Coin/Token	19	01-002738-04
Plate, TCE Alignment 50c, 1 Rand Coin	19	01-002738-05
Plate, TCE Alignment 50c, 1 Rand Token	19	01-002738-06
Plate, TCE Alignment 50c, CNDN $1	19	01-002738-07
Plate, TCE Alignment 50c, CNDN $2	19	01-002738-08
Plate, TCE Alignment 50c, 2000L Token	19	01-002738-09
Plate, TCE Alignment 50c, Emperyal Token	19	01-002738-10
Plate, TCE Alignment 50c, 500LL	19	01-002738-11
Plate, TCE Alignment 50c, NRI Coin Mech	19	01-002738-12
Plate, TCE Alignment 50c, Sigma Token	19	01-002738-13
Plate, TCE Alignment 50c, Windsor .50	19	01-002738-14
Plate, TCE Alignment 50c, $1 Token	19	01-002738-15
Plate, TCE Alignment 50c, $2 Token	19	01-002738-16
Plate, TCE Alignment 55c, IDX	19	01-002738-17
	Dwg Ref	**WMS Gaming #**
Reflector, WBA LED	16	01-003229
Screw, 4-40x20 Phillips	69	4004-01005-20
Socket, Starter	14	20-9849
Socket, Fluorescent Lamp	15	20-9848
Spring, .028 x .750 x .030 crs zn	56	10-002555
Starter, 4-22 w/Condenser	5	20-002780
TCE, Back 50c .05	40	21-002576-01ZZZ
TCE, Back 50c .25	40	21-002576-02ZZZ
TCE, Back 50c .50	40	21-002576-03ZZZ
TCE, Back 50c $1	40	21-002576-04ZZZ
TCE, Back 50c 1 Rand Coin	40	21-002576-06ZZZ
TCE, Back 50c $1 CNDN	40	21-002576-07ZZZ
TCE, Back 50c .50 Token	40	21-002576-08ZZZ
TCE, Back 50c 1 Rand Token	40	21-002576-09ZZZ
TCE, Back 50c $2 CNDN	40	21-002576-12ZZZ
TCE, Back 50c .10 Tkn 500LL	40	21-002576-13ZZZ
TCE, Back 55c Sigma Tkn	40	21-002576-15ZZZ
TCE, Back 55c .50 Windsor	40	21-002576-16ZZZ
TCE, Back 55c $1 Windsor	40	21-002576-17ZZZ
TCE, Back 55c $2 Windsor	40	21-002576-18ZZZ
TCE, Back 55c $2 Ontario	40	21-002576-19ZZZ
TCE, Front-Grv w/o Plngr	54	21-002729-01ZZZ
TCE, Front-Grv w/Plngr	54	21-002729-02ZZZ
Tray, Bulb Lamp	9	01-003234
Washer, Flat .320 x .750 x .030 crs zn	55	4700-002560-00
Washer, .254 x .500 x .006 SW (spring)	61	4705-00003-00
Washer, Flat .265 x .500 x .067 crs zn	41	4700-00030-00

NOTICE

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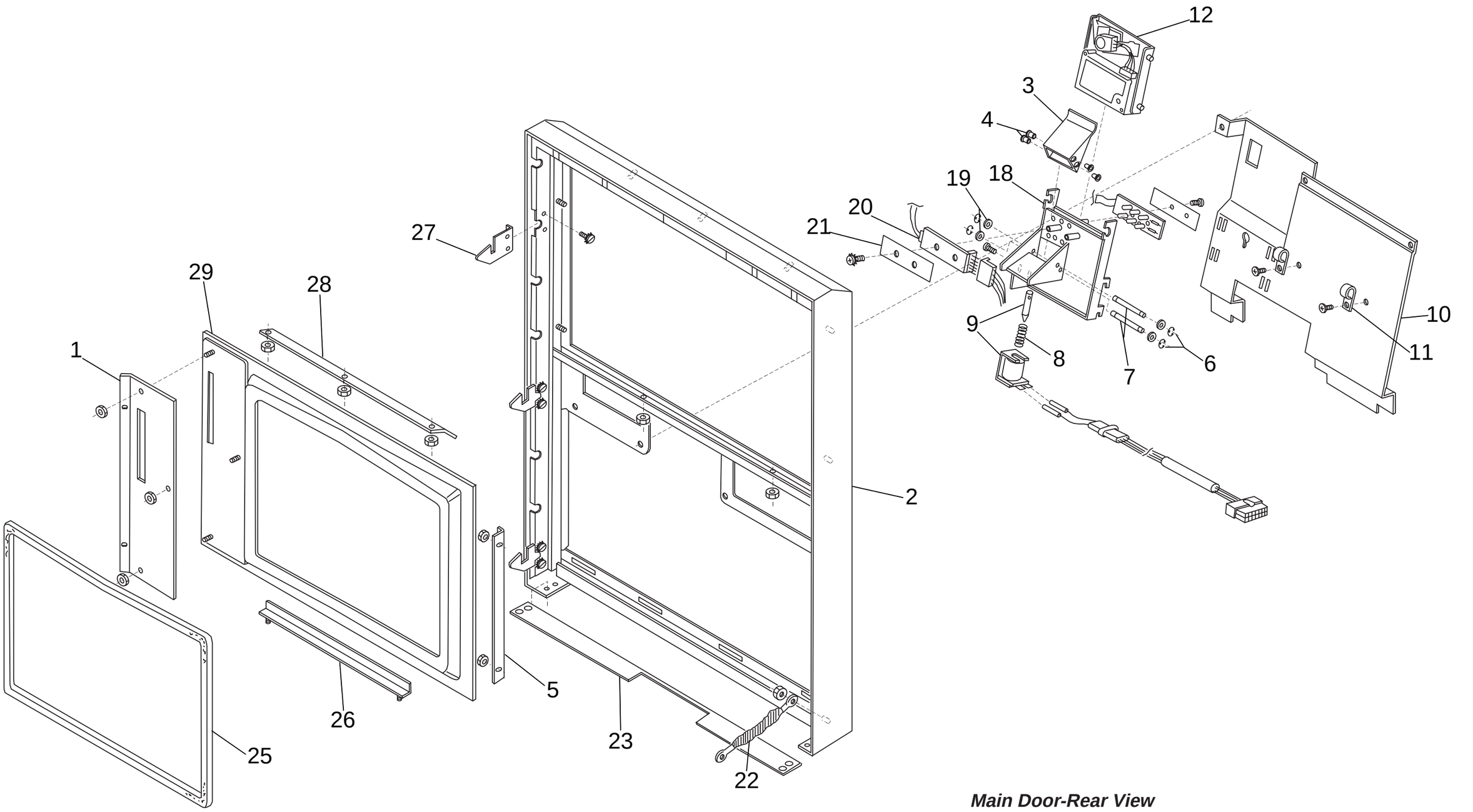
Example Parts

Item A
- Item B
  - Item C

NOTICE

To order parts with a "ZZ" or "ZZZ" part number suffix, specify part



Main Door-Rear View

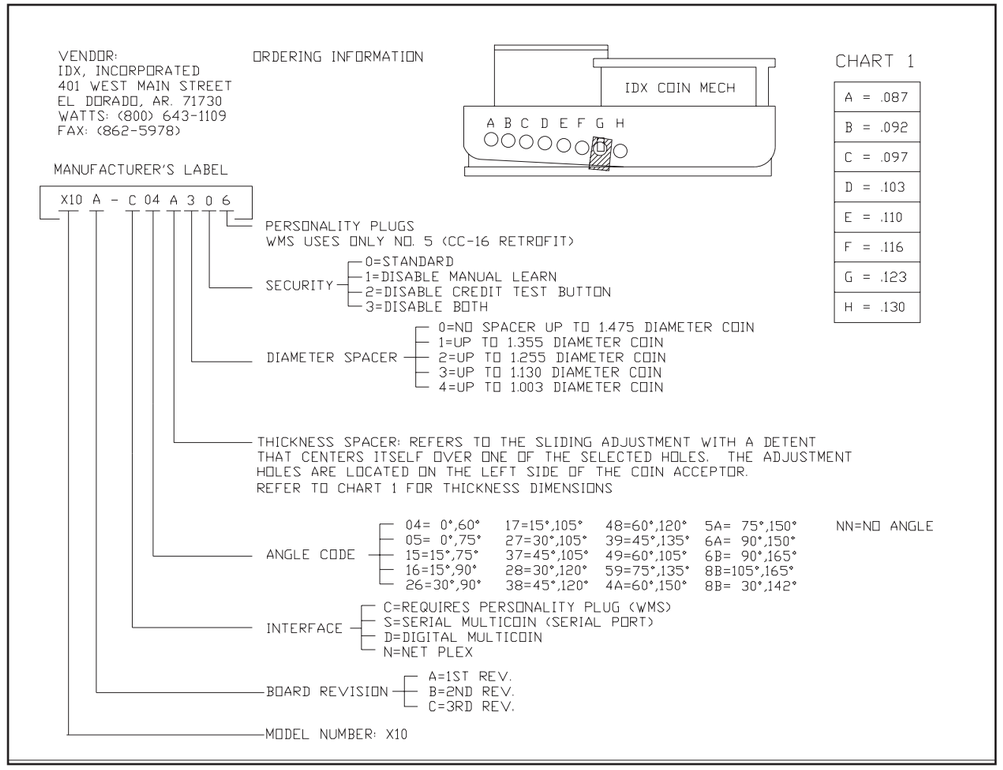
• Door, Main-Rear

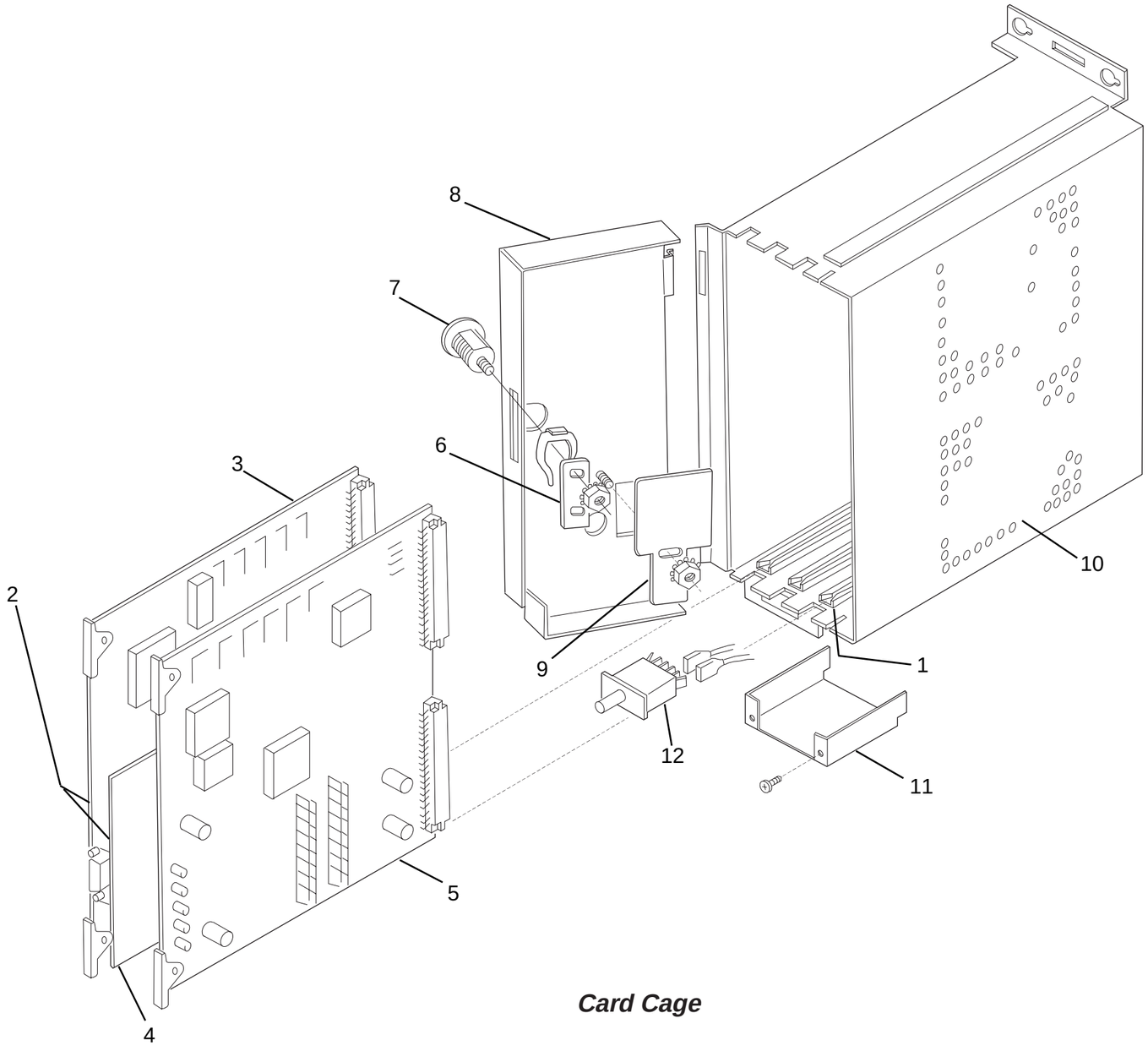
	Dwg Ref	WMS Gaming #
Bearing, Nyliner 1/8	4	20-8790-9
Bezel, Monitor 55C	29	03-004070
Bracket, Bezel Mtg LH	5	01-002858
Bracket, Bezel Mtg Lower-55C	26	01-002881
Bracket, Bezel Mtg RH 55C White	1	01-004071-P05
Bracket, Bezel Mtg Top-55C	28	01-002516
Cable, 1/2" Braided Jumper 8" Long	22	5797-002377-00
Chute, Opto/Diverter Mtg-55C	18	01-003837
Clamp, Cable 1/2", Metal	11	20-003561
Coin Mech, CC-16d-Inhibit	12	09-42000-1
Coin Mech, CC-16d-Inhibit $1	12	09-42000-2
Coin Mech, CC-16d-Inhibit $.50	12	09-42000-3
Coin Mech, CC-16d-Inhibit 1 Rand	12	09-42000-4
Coin Mech, Comparator 2000 LT Coin	12	09-42000-5
Coin Mech, Cmprtr, Windsor, $.50 Tkn	12	09-42000-6
Coin Mech, Cmprtr, $.10 ms Tkn	12	09-42000-7
Coin Mech, NRI Family	12	09-002019-XX
Coin Mech, Condor Family	12	09-005168-XX
Coin Mech, Smart Mark Family	12	09-004584-XX
*Coin Mech, IDX, Dia. .968-.998	12	09-004659-XXX
*Coin Mech, IDX, Dia. 1.095-1.125	12	09-004660-XXX
*Coin Mech, IDX, Dia. 1.220-1.250	12	09-004661-XXX
*Coin Mech, IDX, Dia. 1.400-1.478	12	09-004663-XXX
*Coin Mech, IDX, Dia. .880-.910	12	09-004954-XXX
*Coin Mech, IDX, Dia. .840-.870	12	09-004955-XXX
*Coin Mech, IDX, Dia. 1.118-1.188	12	09-005184-XXX
*Coin Mech, IDX, Dia. 1.035-1.105	12	09-005838-XXX

*Replace the XXX with the appropriate numbers for your coin mechanism.

Coin Mech, Cndr, Prog, Cn 101-1, $.05-$1	12	09-004098
Cover, Door Bottom c/b Hpr Stnis 55C, (98)	23	01-003544-02D04
Cover, Door Bottom c/b Prn Stnis 55L, (98)	23	01-003544-03D04
Cover, Protector Opto Brd	21	03-001612
Diverter, Solenoid w/Pin	9	A-16683
Door, Main Video-55C	2	01-003542-ZZZ
E Ring, 1/8 Shaft	6	20-8712-12
Diverter, Coin	3	01-002864
Hook, Main Door-55C	27	01-002878
Panel, Door Barrier c/b Hopper p/out	10	01-003543-02
Panel, Door Barrier c/b Printer p/out	10	01-003543-01
Panel, Door Barrier c/o Hopper p/out	10	01-003543-04
Panel, Door Barrier c/o Printer p/out	10	01-003543-03
PCB Assy, Hex Optos, Slot	20	A-18097-01
Pin, Diverter Act/Pvt-55C	7	02-003231
Spring, 398 x 1.00-10T Comp	8	10-473
Tape. Polyester Foam	25	RM-22-39
Washer, Flat .130 x .281 x .032 Crs #4	19	4700-00002-00

IDX Coin Mech Legend



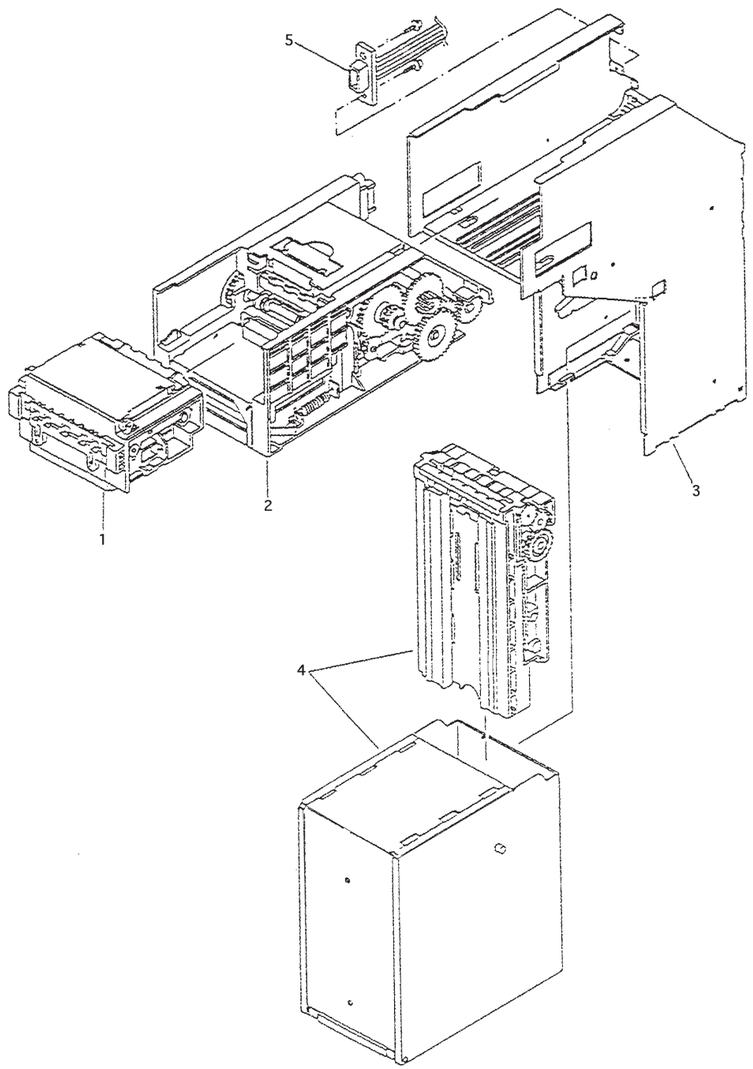


Card Cage

• Cage, Card

	Dwg Ref	WMS Gaming #
Board Assy, CPU 1.5 w/2mb Vid Daughter	2	A-000051-31
Board, CPU System 1.5	3	A-17677-03
Board, Video Daughter (2 mg VGA)	4	A-18402-33
Board, Video I/O	5	A-18886-01
Cage, PCB 1.5-2.0 Extd Top	10	01-002602-03
Cam, FLT 1.13 Dual Mtg	6	01-12793-01
Cover, CPU Cage Sw	11	01-002476
Cover, CPU Video	9	01-001148
Door, Card Cage	8	01-002467
Lock, No Key, Shipping	7	20-001608
Rail, Card Guide	1	20-9987-01
Switch, Pan Mnt Dbl Pole, Momen	12	5643-13229-00

BILL VALIDATOR MAJOR PARTS



MAIN PARTS OF BILL VALIDATOR ***(Refer to following drawings.)***

	Dwg Ref	JCM #	WMS Gaming #
Head, WBA-10/11-USA (1M)	1	052457	20-003504-01
Head, WBA-12/13-USA	1	550-100018	20-003504-50
Head, WBA-21-Canadian (1M)	1	054613	20-003504-46
Head, WBA-22/23-USA	1	550-100038	20-003504-53
Acceptor Conveyor 11/21	2	053449	20-003504-02
Acceptor Conveyor 12/22	2	063038	20-003504-51
Acceptor Conveyor 13/23	2	061683	20-003504-52
Cash Box	4	052460	20-003504-04
Cabl,RS232 10/11/21	5	300-100039	5797-002337-00
Cabl,RS232 WBA12/13 jst-mini	5	063496	20-004407
Cabl,RS232 WBA12/13	5	300-100047	20-003504-49
Cabl,RS232 WBA12/13 E/D	5	400-100028	20-003504-48
Frame Unit	3	052459	20-003504-03

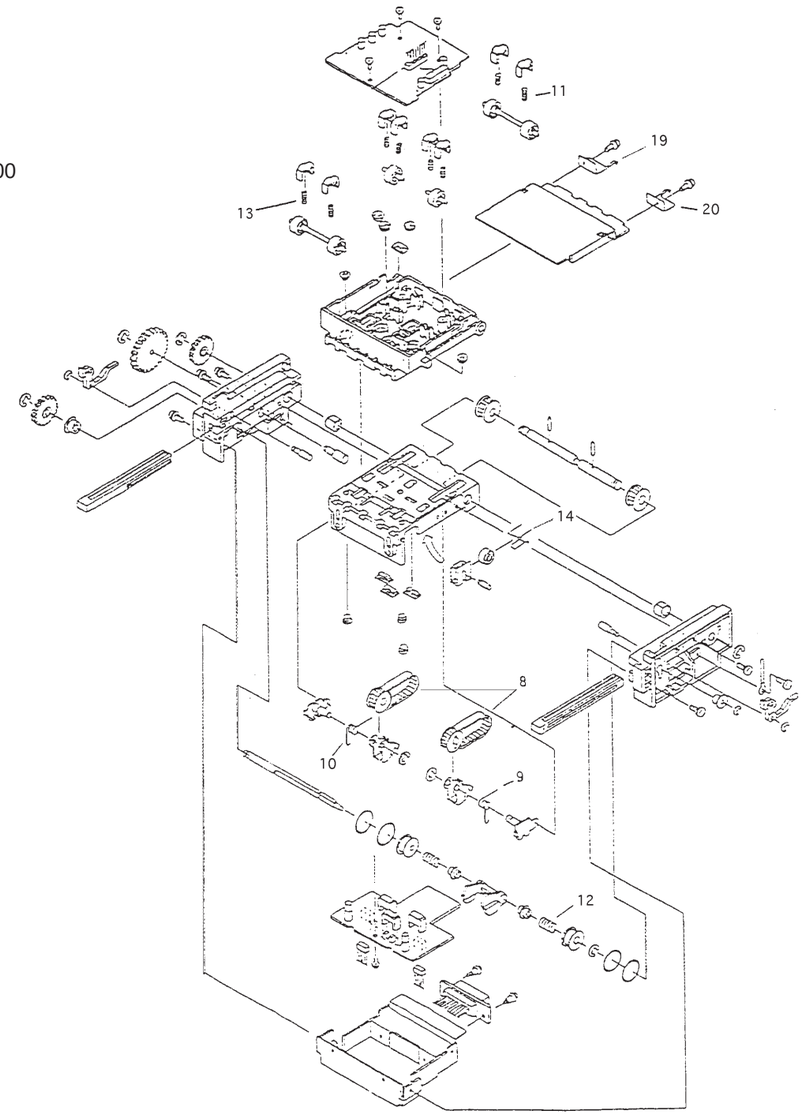
WBA BEZELS (NOT SHOWN)

	WMS Gaming #
Bezel, WBA 66mm Blk 2/LED, US	A-003026-01
Bezel, WBA 66mm Yel 2/LED, US	A-003026-02
Bezel, WBA 71mm Blk 2/LED, Can, Slvk	A-003026-03
Bezel, WBA 71mm Yel 2/LED, Can, Slvk	A-003026-04
Bezel, WBA 77mm Blk 2/LED	A-003026-05
Bezel, WBA 77mm Yel 2/LED	A-003026-06
Bezel, WBA 81mm Blk 2/LED	A-003026-07
Bezel, WBA 81mm Yel 2/LED	A-003026-08

BILL ACCEPTOR HEAD

	Dwg Ref	JCM #	WMS Gaming #
Belt, Timing	8	052585	20-003504-05
Spring, VT R	9	052635	20-003504-06
Spring, VT L	10	052636	20-003504-07
Spring, TR	11	052637	20-003504-08
Spring, VL	12	052638	20-003504-09
Spring, TR 2	13	052639	20-003504-10
Spring, HDR	14	052657	20-003504-11
Spring, Ground Plate L	19	053623	20-003504-12
Spring, Ground Plate R	20	053624	20-003504-13

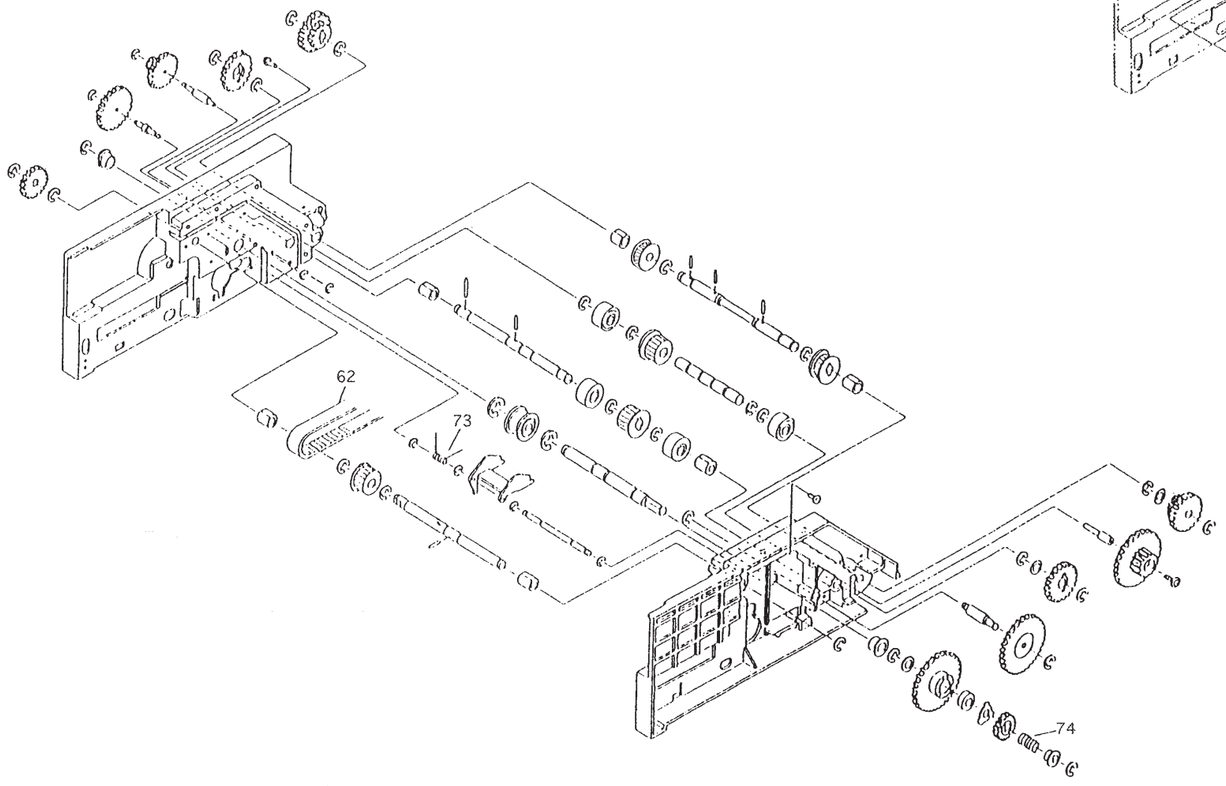
BILL ACCEPTOR HEAD



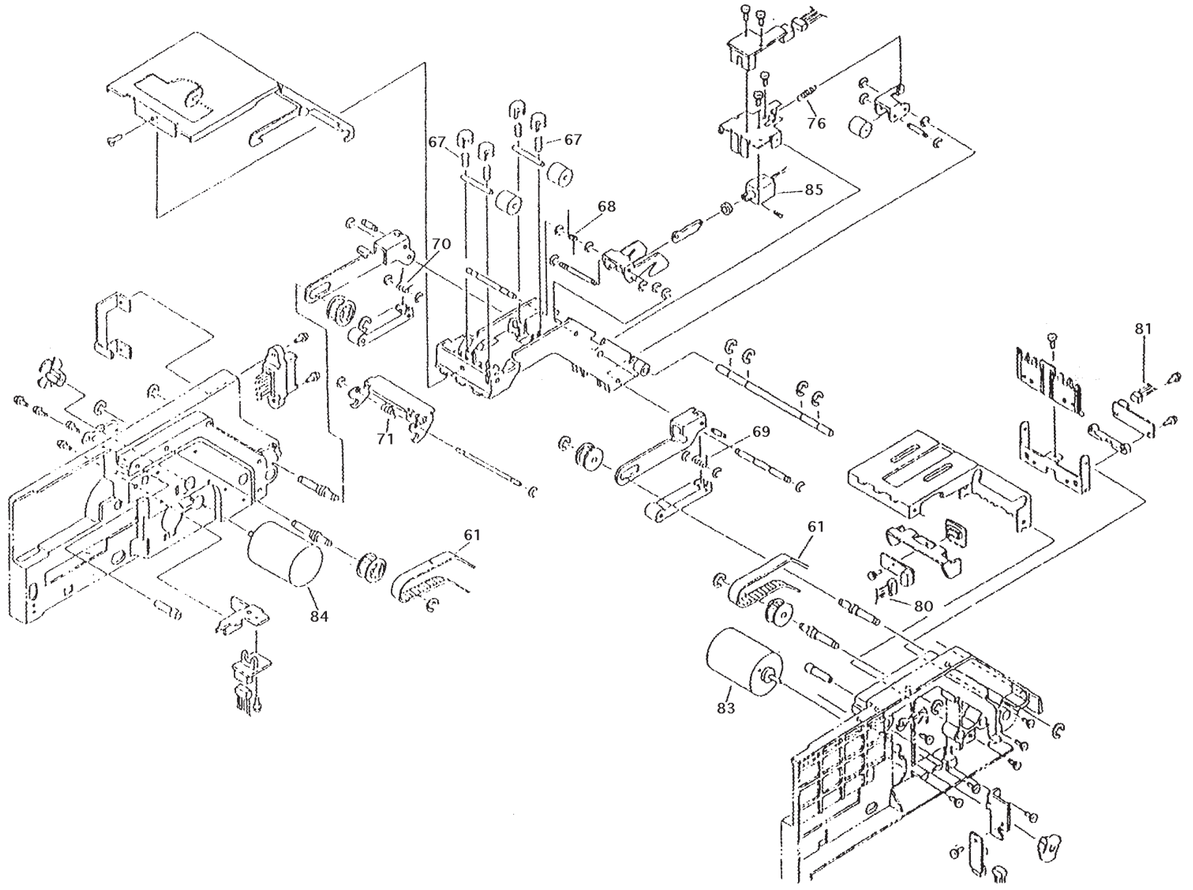
ACCEPTOR CONVEYOR, FIGURE 1

	Dwg Ref	JCM #	WMS Gaming #
Belt, Timing	62	052585	20-003504-25
Spring, FIN	73	052645	20-003504-32

ACCEPTOR CONVEYOR, FIGURE 1



ACCEPTOR CONVEYOR, FIGURE 2



Spring, G	74	052646	20-003504-33

ACCEPTOR CONVEYOR, FIGURE 2

	Dwg Ref	JCM #	WMS Gaming #
Belt, Timing	61	052584	20-003504-24
Spring, TR	67	052637	20-003504-26
Spring, SOL	68	052640	20-003504-27
Spring, SVT R	69	052641	20-003504-28
Spring, SVT L	70	052642	20-003504-29
Spring, TRC	71	052643	20-003504-30
Spring	76	052656	20-003504-35
Harness, Stacker Sensor 2	80	052681	20-003504-37
Harness, Stacker Sensor 3	81	052682	20-003504-38
Motor, Stacker	83	052771	20-003504-39
Motor, Conveying	84	052772	20-003504-40
Solenoid, Assy	85	052843	20-003504-41

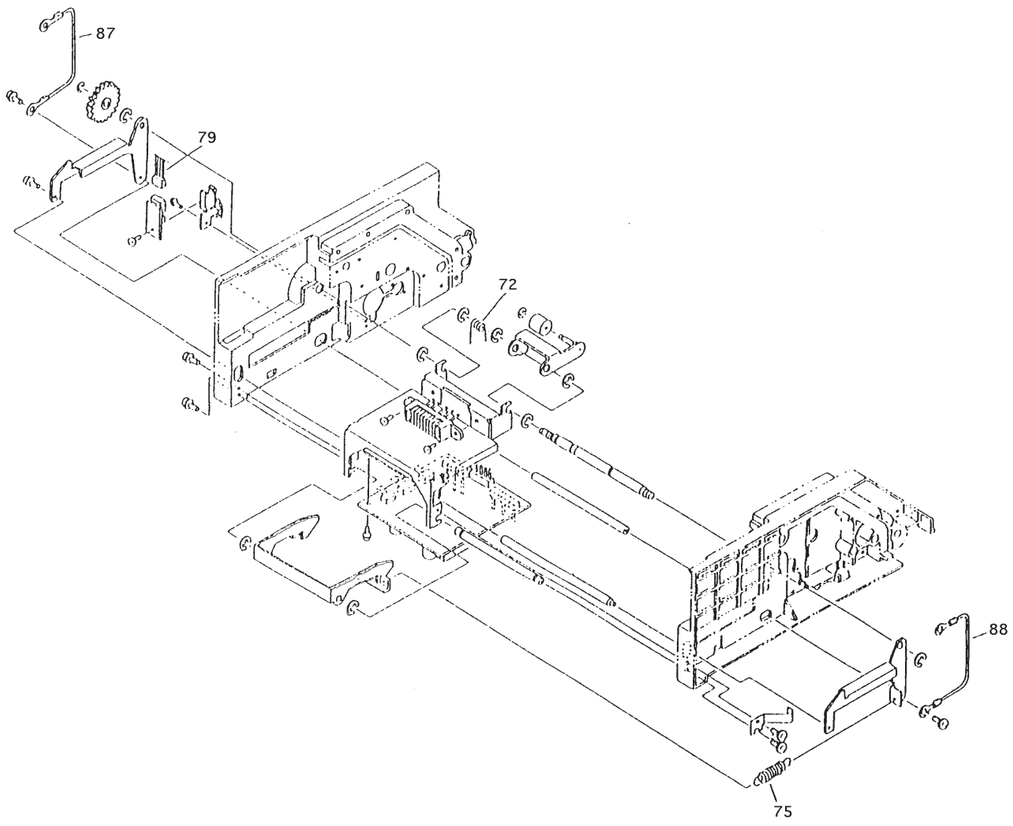
ACCEPTOR CONVEYOR, FIGURE 3

	Dwg Ref	JCM #	WMS Gaming #
Spring, SVT C	72	052644	20-003504-31
Spring	75	052647	20-003504-34
Harness, Stacker Sensor 1	79	052680	20-003504-36
Harness, Frame Ground 1	87	053677	20-003504-42
Harness, Frame Ground 2	88	053678	20-003504-43

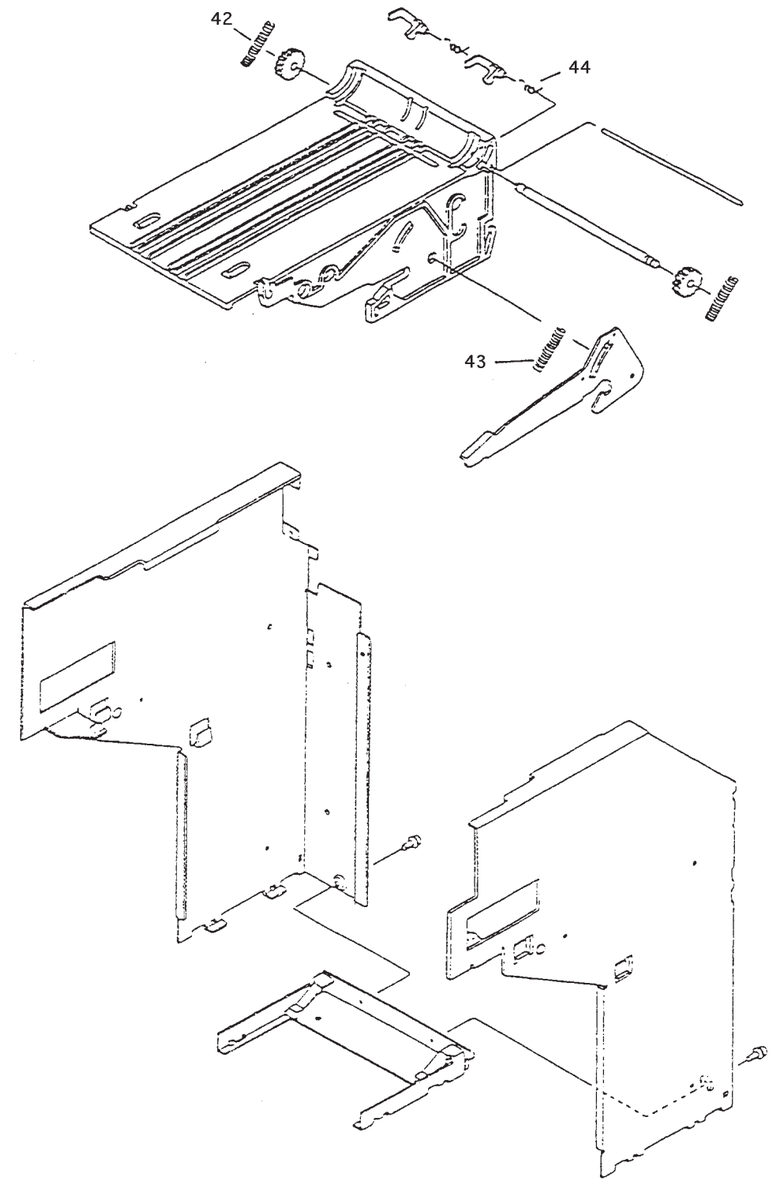
FRAME UNIT

	Dwg Ref	JCM #	WMS Gaming #
Spring, FG	42	052648	20-003504-21
Spring, BL	43	052649	20-003504-22
Spring, FL	44	052650	20-003504-23

ACCEPTOR CONVEYOR, FIGURE 3

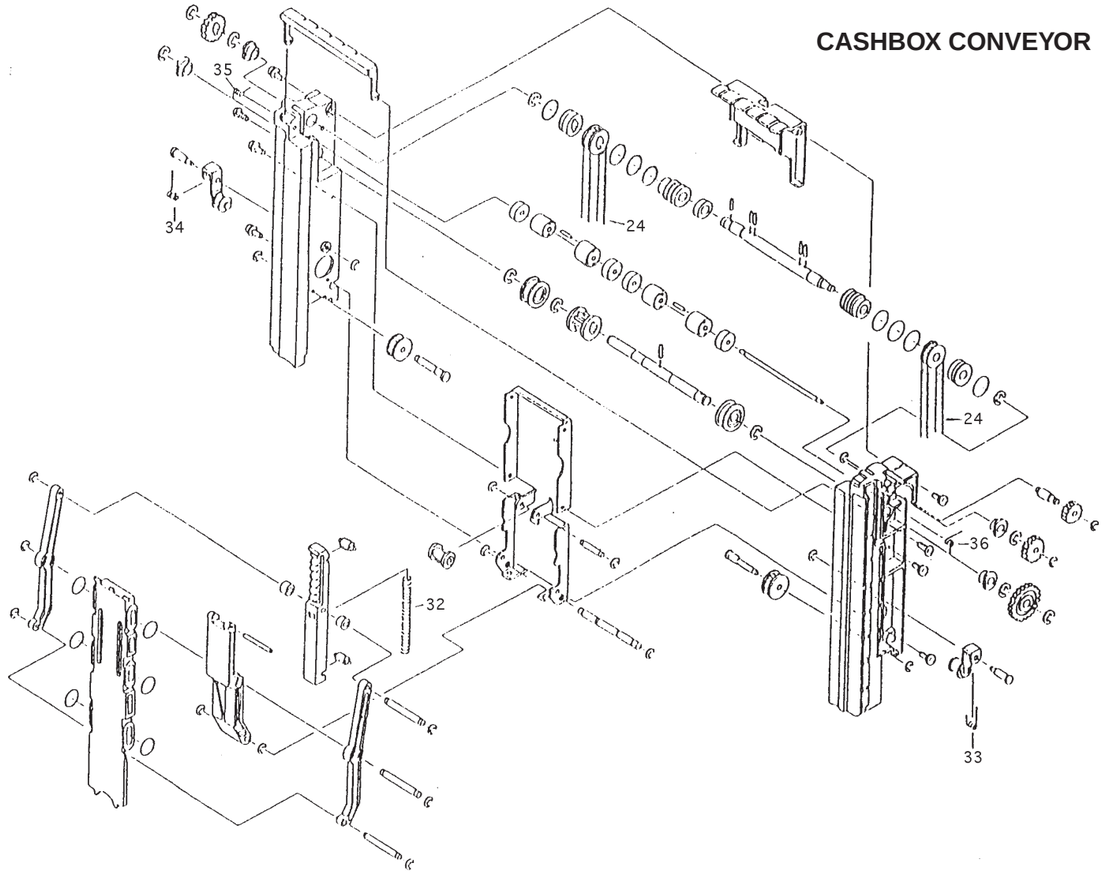


FRAME



CASHBOX CONVEYOR

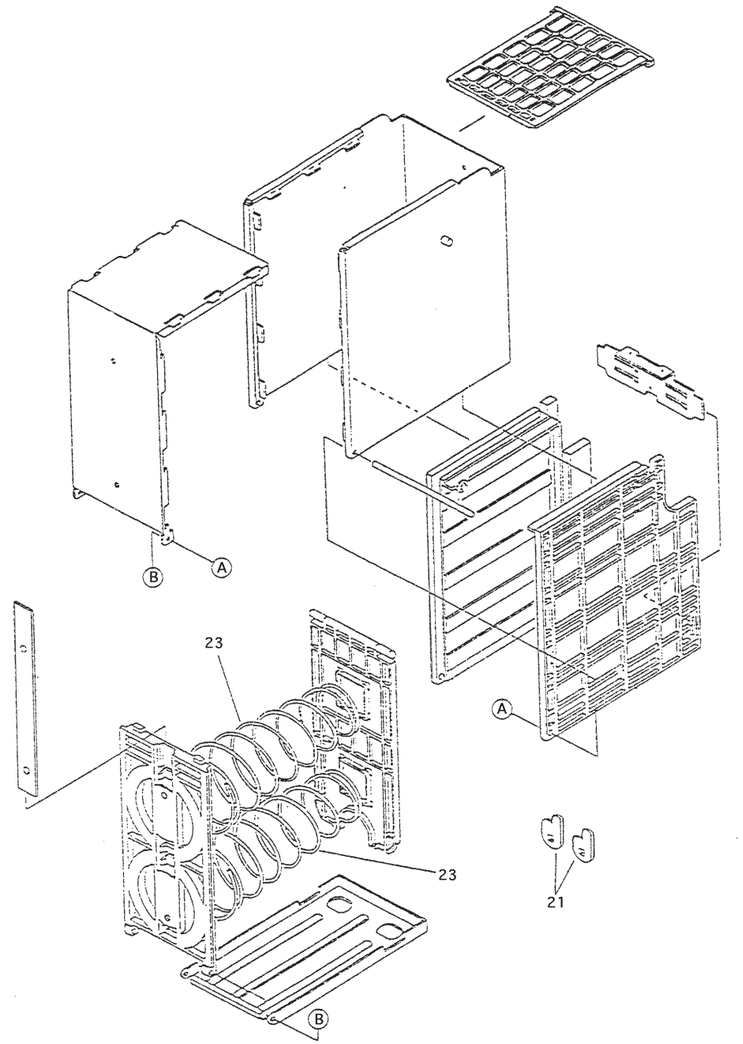
	Dwg Ref	JCM #	WMS Gaming #
Belt, Timing	24	052583	20-003504-15
Spring, PU	32	052651	20-003504-16
Spring, PVT R	33	052652	20-003504-17
Spring, PVT L	34	052653	20-003504-18
Spring, PR R	35	052654	20-003504-19
Spring, PR L	36	052655	20-003504-20



CASHBOX CONVEYOR

CASHBOX

	Dwg Ref	JCM #	WMS Gaming #
Cam, Cassette	21	052505	20-003504-45
Spring, Receiver Plate	23	034859	20-003504-14



CASHBOX

Printed Circuit Board	Bar Top Video	Upright 17" Video	Upright 19" Video	Slant Top 19" Video	Slant Top Slot	Upright Slot
Backplane PCB, A-003622-00	✔					
Backplane PCB, A-000632-01		✔				
Backplane PCB, A-18905-03			✔	✔	✔	
Backplane PCB, A-17937-03						✔
CPU 1.5 PCB with 2MB Video Card, A-000051-31; includes...	✔	✔	✔	✔		
•CPU PCB, Sys 1.5, A-17677-03	✔	✔	✔	✔	✔	✔
•Daughter Card, 2MB Video, A-18402-33	✔	✔	✔	✔		
CPU PCB, Sys 1.5 Plus, A-004275-03 CPU PCB, Sys 1.5 Plus, A-004275-04	✔ ✔	✔ ✔	✔	✔ ✔		
Hopper Control PCB, A-17118-02	✔	✔		✔	✔	✔
I/O PCB, A-18886-01	✔	✔	✔	✔		
I/O PCB, A-17686-03					✔	✔
Lamp PCB, BV, A-19861-01				✔	✔	
Lamp PCB, BV, A-18088-01						✔
Lamp PCB, Payline, A-18087-00					✔	✔
Lamp PCB, Reel Display, A-17382-01					✔	✔
Meter Driver PCB, A-002464-00		✔				
Meter Driver PCB, A-17951-01	✔		✔	✔	✔	✔
Opto PCB, Hex, A-18097-01	✔	✔	✔	✔	✔	✔
Opto PCB, Quad, A-18097-00						✔
Power Distribution Unit PCB, A-18938-03 w/16 Pin Xfmr	✔	✔	✔	✔	✔	✔
Power Distribution Unit, PCB, A-18938-01 w/12 Pin Xfmr				✔	✔	✔
Reel Motor Control PCB, 20-002002					✔	✔

NOTICE

Many GD models employ the same CPU and I/O Boards. However, socketed EPROMS and PLDs on those boards are model or jurisdiction specific. You must install the appropriate EPROMS and PLDs before you can swap boards between models.

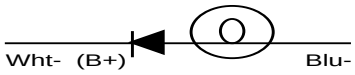
NOTICE

Canadian upright slots require a special bill validator general illumination cable, part H-002132.

NOTICE

The lamp matrix of some gaming devices may include fewer or additional lamps.

Lamp Matrix



COL / ROW	0 Wht-Blk Q3	1 Wht-Brn Q4	2 Wht-Red Q7	3 Wht-Orn Q8	4 Wht-Yel Q11	5 Wht-Grn Q12	6 Wht-Blu Q15	7 Wht-Vio Q16
Blu-Blk Q1 0	Hard Meter Lamp 1	9	17	25	33	41	49	57
Blu-Brn Q2 1	2	10	18	26	34	42	50	58
Blu-Red Q5 2	3	11	19	27	35	43	51	59
Blu-Orn Q6 3	4	12	20	Blu (No 28	36	44	52	60
Blu-Yel Q9 4	5	13	21	Hold 1 29	Hold 2 37	Hold 3 45	Hold 4 53	Hold 5 61
Blu-Grn Q10 5	6	14	Player Panel Btn 11* 22	30	Player Panel Btn 12* 38	DBV LED 2 46	DBV LED 3 54	62
Trace) Q13 6	7	15	23	31	39	Tower Lamp, Bottom 47	Tower Lamp, Middle 55	Tower Lamp, Top 63
Blu-Vio Q14 7	Max Bet 8	Play 16	Bet 1 24	Collect 32	40	48	56	64

Programmed and Field Programmable Chip Summary

Board	Chip Location	Chip Type	Description	Part Number
Backplane	U1	EEPROM	x24C04, 512 x 8 bit	5345-13920-00
CPU	U4, U5	Static RAM	32K x 8 CMOS, Low-Power	5340-14212-00
CPU	U26*	EEPROM	4 kilobit DIP EEPROM	5345-13617-00
CPU	U38-U40	Sound Static RAM	2K x 8, 35nS, 6116 (Sound RAM)	5340-13304-00
CPU	XU2	Game EPROM	27C040, 512K x 8, 100nS	(Order by Game Name)
CPU	XU3	Game EPROM	27C040, 512K x 8, 100nS	(Order by Game Name)
CPU	XU12	PLD	PLCC, MACH 110, 15 nS	A-002421
CPU	XU17	Sound EPROM	27C040, 512K x 8, 100 nS or 27C8001, 1024K x 8, 100 nS	(Order by Game Name)*
CPU	XU18	Sound EPROM	27C040, 512K x 8, 100 nS or 27C8001, 1024K x 8, 100 nS	(Order by Game Name)*
CPU	XU24	PLD	GAL, 16V8, 15 nS	A-18264*
CPU	XU25	PLD	GAL, 16V8, 15 nS	A-18265
CPU	XU30	Sound EPROM	27C040, 512K x 8, 100 nS	(Order by Game Name)*
CPU	XU31	Sound EPROM	27C040, 512K x 8, 100 nS	(Order by Game Name)*
CPU	XU33	PLD	GAL, 16V8, 15 nS	A-18266
CPU	XU37	ADSP-MPU	2105 KP 40 ADSP-MPU (Sound)	5400-13298-00
I/O	XU13	PAL	PLCC, MACH 110, 15 nS	A-000146
I/O	XU25	PAL	GAL, 16V8, 15 nS	A-18123
I/O	XU28	PAL	GAL, 16V8, 15 nS	A-19468
I/O	XU42	FPGA	3030A-70PC84C Xilinx Field Programmable Gate Array	5352-14012-00
Video	U1	PLD	GAL, 16V8, 10nS	A-15974-03
Video	U3-6	Dynamic RAM	Video DRAM, 4M x 1	5349-13123-00

*EEPROM: Also XU27 on some machines. Sound EPROM: Some machines don't use all four sound EPROMs.

NOTICE

This manual covers software through OS version 2.39.

Candle Codes

Candle Section	Candle Activity	Meaning
Top	Off	Machine is idle
	On	Change request
	Slow Flash	Tilt or Jackpot Mode
Bottom	Off	Main door closed
	Fast Flash	Main door open
	Slow Flash	Jackpot

Startup Sound Codes

No. of Bongs	Problem
0	Speaker disconnected or sound circuit problem
1	System is normal
2	Bad EPROM XU30 or CPU jumper JP2*
3	EPROM XU31 is bad
4	EPROM XU17 is bad
5	EPROM XU18 is bad
6-9	Not Used
10	Bad Sound RAM U38, U39 or U40

*CPU Board Jumper J2

Jumper Position	Meaning
"P7" to "P7 OUT"	8 meg sound EPROMs
"P7 OUT" to "+5"	4 meg sound EPROMs

I/O Board LEDs

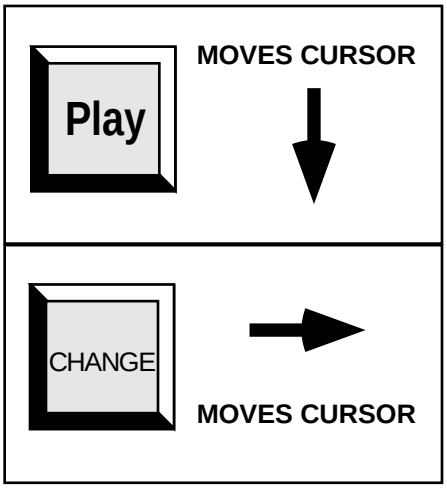
- **No LEDs light:** Check PDU fuse continuity.
- **All LEDs light:** Bad or loose CPU or I/O Board. Check EPROMs.
- **DS1 is on. Another LED is off:** Bad power supply.

Tilt Codes

Display	Meaning
• CPU Board EEPROMs	
Secure Mem CRC Corrupt	Bad CPU EEPROM
Sec Mem Incorrect Password	Different or bad EEPROM
Secure Memory Failure	Bad CPU EEPROM
Secure Mem Options Updated	Change in restricted feature
• CPU EPROMs	
ROM Checksum Error	Bad CPU Board EPROM
• DBV/Coin Mech	
Bill Stacker Missing	No stacker in DBV
Bill Validator Jam	Bill stuck in DBV
Bill Validator Comm Fault	DBV won't talk with port
Coin Jam	Coin jammed in machine
Reversed Coin	Player reversed coin in chute
(DBV LEDs off)	Bill validator full or failure
Invalid Bill	DBV rejected bill
Long Coin	Coin signal lasted too long
• Door Access	
Bill Door Open	Open Bill Door
Drop Door Open	Open Drop Door
Main Door Open	Open Main Door/Power Off
Main Hood Door Open	Open Monitor Hatch
Bill Jam Service Door Open	Open Top DBV Door
Logic Door Open	Open Logic Door
• Hand-Pay Situation	
HAND PAY xxx CREDITS— CALL ATTENDANT	Attendant pays xxxxx credits
JACKPOT! Call Attendant	Attendant must hand pay
• Hard Meter	
Mechanical Meter Failure	Dead mechanical meter
• Hopper	
Hopper Empty	No coins in hopper
Hopper Extra Coin Paid	Hopper dispensed extra coin
Hopper Jam	Coins or debris jam hopper
Hopper Runaway	Runaway hopper
• Printer	
Printer Error	Malfunctioning printer
• Programmable Gate Array	
Xilinx PGA Failure	Bad Xilinx® com chip
• Static RAM	
Battery Fail	Dead battery
CRC Corrupt	Op sys data corruption
Deck Corrupt	Bad deck of cards
Heap Corrupt	Corrupt 'heap' memory area
Heap Full	Full 'heap' memory area
Memory Cleared	You cleared the RAM
RAM Signature Corrupt	Wrong RAM signature
Recoverable Auxiliary Main Meter Corruption	Recoverable auxiliary main meter corruption
Recov Main Meter Corruption	Recov main mtr corruption
Unrecov Game Meter Corrupt	Unrecov game mtr corrupt
Unrecov Main Meter Corruption	Unrecov main mtr corrupt
• Touch Screen	
No Touch Screen Response	Bad T/S cable or board
Touch Screen Coms Fault	Bad cable, bd or I/O input

CPU Board 7-Segment Display

Displayed Number	Situation
None	•Constantly ("8" never appears): One power voltage is absent.
	•After "8" clears: System OK.
8	•Briefly: System OK.
	•Constantly: Bad EPROMS XU2 and XU3, or bad CPU Board.



Touch Screen Fail? Use Player Panel Buttons

If the touch screen malfunctions, you can use two buttons to perform touch screen functions.

- **PLAY** moves the cursor downward. After the cursor reaches the screen's bottom edge, the cursor wraps around.

- **BET ONE** (or **CHANGE**) moves the cursor horizontally, toward your right. After the cursor reaches the right edge of the screen, the cursor wraps around.

To make a selection...

- ❑ 1. Turn the Attendant Key switch to enter Administration Mode.
- ❑ 2. Use PLAY and BET ONE to move the cursor. Set the cursor atop the screen button that you want to select.
- ❑ 3. Simultaneously press both buttons to enter your selection.

Notes